DECEMBER 1960

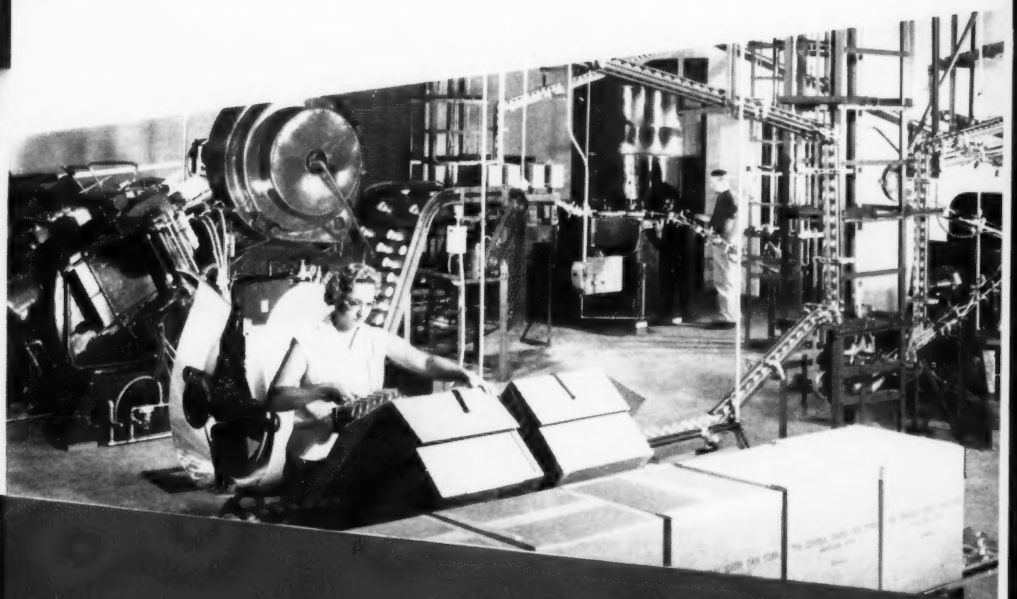
THE MAGAZINE OF APPLIED TECHNOLOGY
FOR MEN WHO MANAGE

Single evaporator with efficiency of 10 effects shown for first time at Dairy Show.....77

The impact on packaging of the additives law.....25

FOOD PROCESSING

Gamma ray density controller for juice evaporation saves Sunkist $6000 a year . . . page 28



Mass produce aluminum cans from precoated foil . . . page 26

Edible protective coating—a new preservative technique for many foods.
Also FDA approved: an edible lubricant . . . page 38

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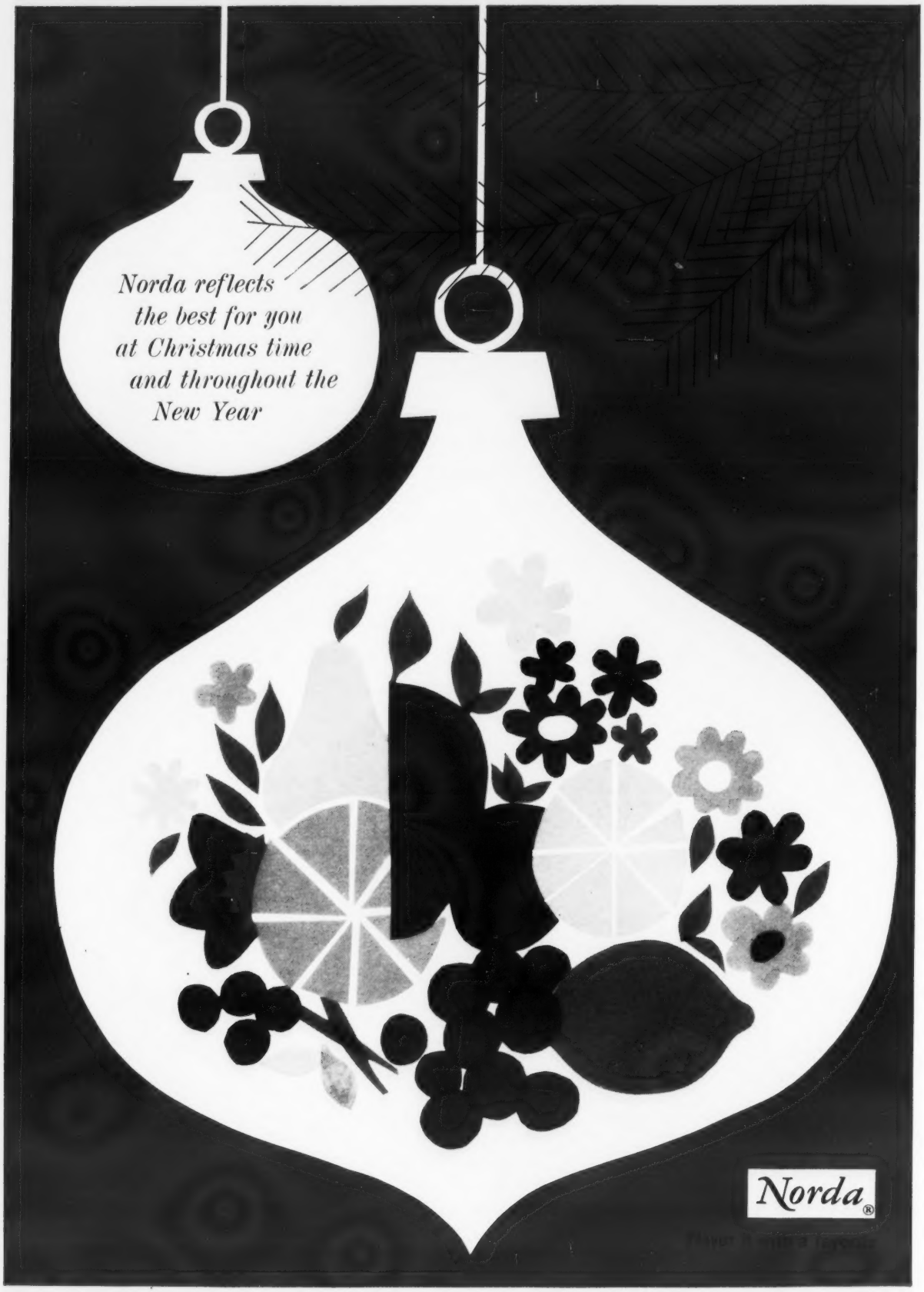

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that's interesting

Developing development

Nineteen reporting companies in the Food and Beverage category of a recent American Management Association survey will have spent an average 13.1 per cent more in 1960 for product and process development than for the same purposes in 1959. Last year, the 19 firms spent for development an average 1.7 per cent of the year's sales.

Helps keep Navy regular?

A sub-stantial role is reported for instant citrus juice crystals aboard *U.S.S. Triton* during the atom-powered submarine's recent underwater round-the-world trip. Aboard ship were 509 lb of orange crystals and 210 lb of grapefruit crystals — exclusive products of Plant Industries, Inc., Plant City, Fla.

The crystals weigh only half as much as frozen concentrate, and require no refrigeration. When mixed with water, one lb produces a gallon of juice of excellent acceptability rating, according to Navy palates.

Solution to juice 'stockpiling'

Plastic-wrapped tomato "juice" may solve an economic problem for California tomato-concentrate producers who ship huge quantities East, for reprocess into catsup, etc., during the comparatively short tomato harvest season.

Until now, cans — expensive both in material and labor — have been most practical method for shipping and subsequent storage. However, studies at University of California's Food Science and Technology department, Davis campus, under a $5000 Dow Chemical Company grant, indicate that bulk 100-lb lots of puree packaged in plastic may be equally practical, and considerably more economical.

Chemical sandman saves saplings

Little Florida money trees — citrus variety — are very susceptible to frost, can be damaged if exposed to 26 F for as little as four hr. However, in two-yr test just completed, resistance of young citrus types was increased by MH-30, an agricultural chemical made by the Naugatuck Chemical Division of U.S. Rubber Co.

Known technically as a growth regulant, and used to prevent sprouting in stored potatoes and to slow the growth of grass along parkways, etc., the chemical when sprayed on trees at start of the frost-threat season threw them into temporary dormancy. In this non-growing condition, they were able to withstand lower temperatures.

Cranberries preserve market

Nearly crushed by well-publicized FDA action a year ago, and bogged down for some months thereafter, cranberries now appear to be regaining public relish. Production figures reflect the more optimistic outlook — based on mid-August predictions, the 1960 crop will be four per cent above 1959's record crop, and 29 per cent above the annual average.

Competitors may be green with envy

Colors to make cereals by — happy blue, sunshine yellow, saucy salmon, gay gray and washday white — are part of carefully planned color scheme used in Quaker Oats Company's cereal processing plant in Shiremanstown, Pa.

Systematic use of color, believes plant manager J. E. Esson, Jr., encourages greater production efficiency and better maintenance of equipment and buildings — resulting in a more uniform product manufactured at lower cost.

DOW | announcing VERSENE CA

CONTROL SPOILAGE LOSSES WITH NEW DOW CHELATING AGENT

A NEW APPROACH to problems caused by trace metal ions in food is now available. Versene® CA chelating agent is calcium disodium EDTA (calcium disodium ethylenediaminetetraacetate dihydrate)—a product developed specifically for the food industry. It chemically inactivates troublesome metal ions such as iron, copper and nickel. Such ions, unless controlled, can cause formation of undesirable precipitates and complexes and catalyze oxidative degradation.

UNWANTED PRECIPITATES AND COMPLEXES are widely encountered in food products. Insoluble, needle-like struvite crystals frequently form in canned seafood, decreasing customer acceptance. Complexes of heavy metals appear to be a cause of "gushing" or "wildness" in beer and cloudiness and sedimentation in wine. Versene CA chelating agent solves both these problems. In addition, it may be utilized to eliminate the undesirable blackening caused in cauliflower, asparagus, and potatoes by iron complexes.

RETARDATION OF OXIDATION with Versene CA is an excellent method for stabilizing flavors and odors and thus extending the shelf life of food products based on fats and oils. Inactivation of metal ions not only eliminates the catalytic effect of the ions on the oxidative process, but also enhances the effect of anti-oxidants such as ascorbic acid. Versene CA has been shown to eliminate the white ring which commonly forms on the surface of French dressing during storage. Retardation of oxidation extends the shelf life of mayonnaise, salad dressing, margarine, nutmeats, and similar products.

FDA REGULATIONS on the use of Versene CA in sandwich spreads, malt beverages, and in non-standardized sauces and dressings were published in the August 4, 1960 issue of the FEDERAL REGISTER. Further regulations under the Federal Food, Drug and Cosmetic Act are expected to permit the use of Versene CA in other food products.

FOR FURTHER INFORMATION and samples write Technical Service and Development, THE DOW CHEMICAL COMPANY, Midland, Michigan, Department 605BH12

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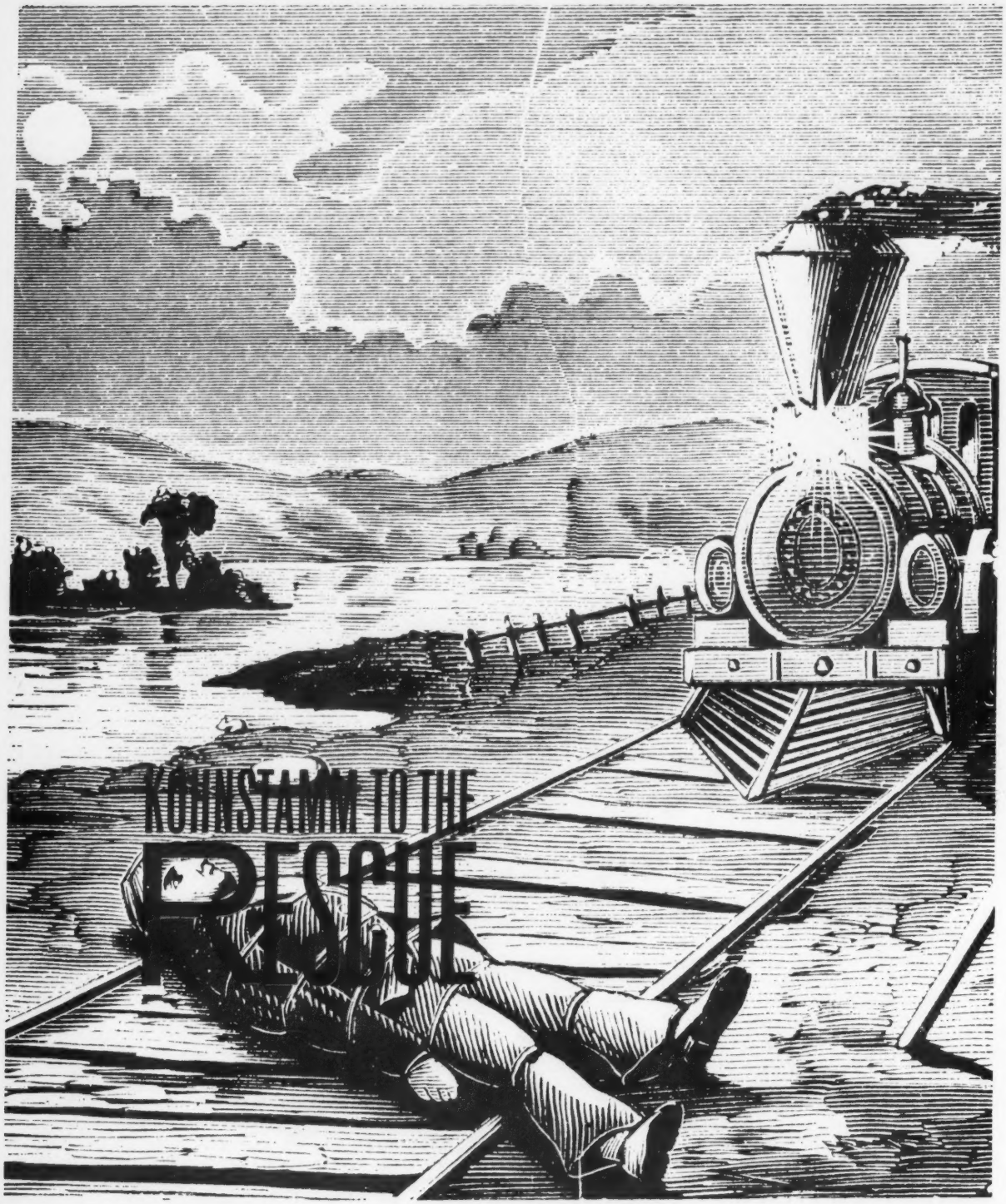

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over the editor's shoulder

Dairy Progress

Many new developments were shown at last month's Dairy Show. Most impressive were the many systems shown for automating processing and CIP operations.

These varied from simple low-cost labor-saving controls to elaborate electronic systems for several manufacturing processes and CIP operations centralized on one board.

Tops is the word for the new half-gallon ice cream carton which is described on page 8 of this issue.

Also described in this issue is the revolutionary Dynamic Recompression Evaporator on page 77.

Other developments will be covered in our regular columns in future issues, for in many respects, FOOD PROCESSING is a monthly exposition of the latest developments in applied technology.

Marion P. Lankford

ASSISTANT EDITOR

*Editor's Note: Marion Lankford is FOOD PROCESSING'S new assistant editor. He is a graduate technologist from Michigan State with 4 years experience in laboratory control followed by 8 years as production manager of dairy operations.

THE MAGAZINE OF APPLIED TECHNOLOGY
FOR MEN WHO MANAGE

DECEMBER 1969
VOL. 21 NO. 12

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CIRCULATION OVER 39,000

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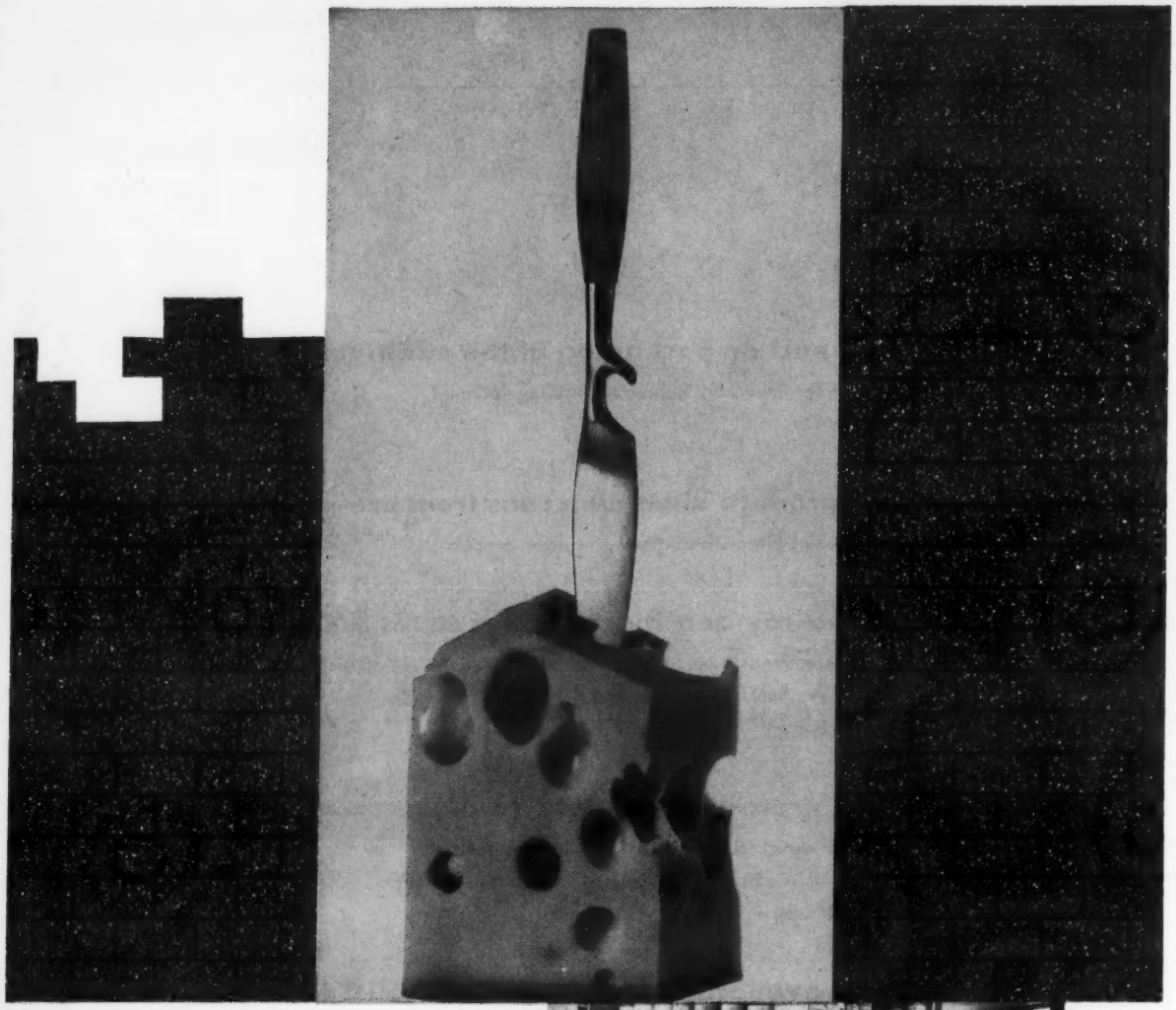

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FOOD PROCESSING

(Food Processing Preview)

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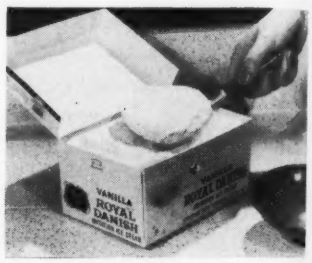
PRODUCTS AND PACKAGES

Flip-open top-serve carton . . .

. . . in two half-gal variations, was introduced at recent Dairy Show. Shown is the top-loading "Flip 'n Dip" carton already in use at Beatrice Foods Los Gatos, Calif., plant for Meadow Gold Royal Danish Frozen Dessert. Filling, at up to 50 cartons per min, is by Anderson filler stationed between two new Kliklok machines that set up cartons from flat blanks, then close filled cartons and seal covers to carton end walls. For existing end-load filling lines, a functionally similar top-opening-and-serving half-gal carton can be produced from "Top Serv" carton blanks, employing a relatively inexpensive attachment to the standard Anderson filler.

Supplier: Marathon, a Division of American Can Co., Menasha, Wis. Circle 7052 for Flip 'n Dip ice cream carton, 7053 for Top Serv ice cream carton.



For convenience 'unpackaging' . . .

. . . the "Zip" family offers easy opening for practically every type of flexible package. Zip-Tape, on Nabisco cracker package, left, is made of cello, comes in any color or width, also can be used for multiple packaging, "bundling" for store shipment and color coding. Zip-String on the Durafilm package, center, is a thin, non-woven Dacron thread, imbedded in the polyethylene coating, and supplied in finished pouches or built into roll-stock combinations. Zip-Strip at right is a series of serrations or perforations in the polyethylene web as bag is fabricated. Two bag styles include flat side-seal with perforations running at any given point across bag face, and seamless, with perforations running away, from top to bottom, at any point side-to-side on bag.

Supplier: The Dobeckmun Co., A Div. of The Dow Chemical Co., P.O. Box 6417, Cleveland 1, Ohio.

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Cello and eggs . . .

. . . is a combination that insures fresh product, plus merchandising appeal. Cellophane controls loss of CO_2 and moisture, prevents cartons becoming limp during humid storage, permits short periods of out-of-case display of eggs for tie-ins to cake mixes, etc., and prevents tampering. On basis of 91.5 overwraps from one lb of recommended grade of cello, cost of material, when added to cost of typical wrapping machine (amortized over five yr) indicates overwrapping cost of less than a penny per carton.

Supplier: American Viscose Corp., 1617 Pennsylvania Blvd., Philadelphia, Pa.

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Loaded with liquid corn oil . . .

. . . new Mazola Margarine for first time brings the nutritional advantages of non-hydrogenated low-saturate-content corn oil to a margarine that meets every standard for premium table-spreads—flavor, firmness at serving temperatures, ease of spreading when cold, melting characteristics and cooking qualities. Seeming paradox of a firm liquid-oil-containing product is result of revolutionary process whereby a matrix of partially hydrogenated oils holds sub-microscopic droplets of liquid Mazola Corn Oil, much as a honeycomb holds liquid honey. Amount of corn oil contained is such that product provides two to three times the content of natural polyunsaturates, or linoleate, as any margarine sold in grocery stores. Introduced nationally in selected markets by Best Foods, Div. of Corn Products Co.

Poly-coated half-gal cartons . .

. . . shown at Dairy Show in Chicago include Sealking model (above) and Canco carton (below). Former, described as first no-wax, poly-plastic-coated single-unit paper half-gal already has been sucessfully introduced by Ira Wilson & Sons Dairy Co. in Detroit. Canco carton is about to undergo first field test at a Rochester, Minn., dairy.

Suppliers: Sealking poly-coated carton by Sealright Co., Inc., Fulton, N. Y.

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Canco poly-coated carton by American Can Co., 100 Park Ave., New York 17, N. Y.

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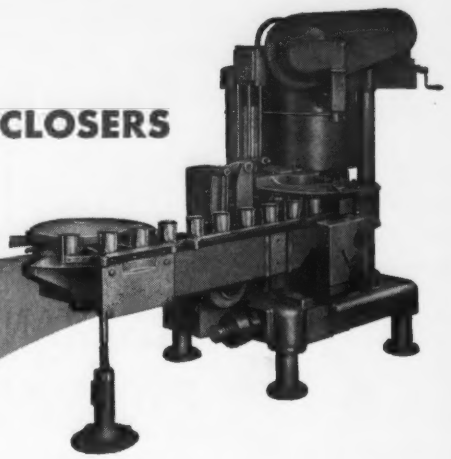
ANGELUS CAN CLOSERS



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conventions and exhibits

Dec. 26-31. American Assn. for the Advancement of Science, annual meeting, Philadelphia.

Jan. 8-10. National Preservers Assn., annual convention, Galt Ocean Mile Hotel, Ft. Lauderdale, Fla.

Jan. 17-19. Instrument Society of America, Winter Instrumentation-Automation Conference & Exhibition, Sheraton-Jefferson Hotel, Kiel Auditorium, St. Louis, Mo.

Jan. 22-25. National Canners Assn., annual meeting (inincluding concurrent Canning Machinery & Supplies Assn. exhibit of canning and freezing machinery, supplies and services), Conrad Hilton Hotel, Chicago.

Jan. 23-26. 12th annual Plant Maintenance & Engineering Show and concurrent (Jan. 23-25) Conference, International Amphitheatre, Chicago.

Feb. 1-4. American Society of Heating, Refrigerating and Air-Conditioning Engineers, and 2nd Southwest Heating and Air-Conditioning Exposition, Baker Hotel and Memorial Auditorium, Houston.

Feb. 5-8. National Dairy Council, 46th annual meeting, Brown Hotel, Louisville, Ky.

Feb. 6-8. California Freezers Assn., 17th annual meeting, Mark Thomas' Inn, Monterey, Calif.

Feb. 10-12. Institute of American Poultry Industries, 32nd annual Fact-Finding Conference, Municipal Auditorium, Kansas City, Mo.

Feb. 28-*Mar.* 1. Ninth annual National Dairy Engineering Conference, Michigan State University, East Lansing. Dept. of Agricultural Engineering, Michigan State University, in cooperation with MSU Dept. of Food Science and National Assn. of Dairy Equipment Manufacturers.

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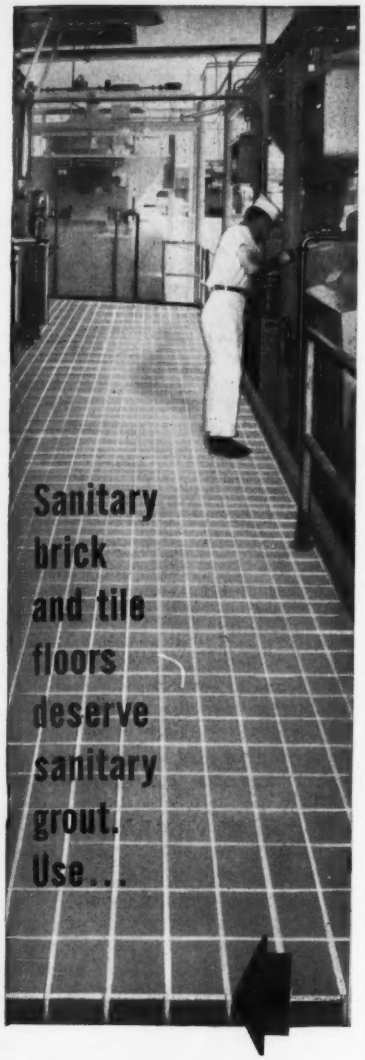

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food regulations

What Kennedy administration will mean to food processors

Closer inspection, tighter controls, less sympathetic ear to business

The effect of the new administration in Washington won't be felt until late spring or possibly the fall. It will take at least that long to organize the executive departments, establish a working liaison with the new Congress and begin pushing new legislative programs.

As president, Kennedy will have an advantage not enjoyed by his predecessor: a Congress in which his party holds majorities in both houses. This means a smoother path for the budget and a greater likelihood of approval for specific measures.

What does this mean to the food processor?

Like every other businessman he can probably look forward to a *less* sympathetic ear in Washington and fewer cabinet-level officers friendly to the business viewpoint.

Example: Under the Democratic administrations, the Secretary of Labor almost always is a more influential person than the Secretary of Commerce. Result: A still stronger position for labor — a weaker one for business and industry.

Be prepared to oppose still stronger controls right across the board, more government intervention in corporate affairs through existing agencies — FDA, USDA, Justice Department, Federal Trade Commission and ICC.

This doesn't mean these agencies will suddenly turn into unreasonable bureaucratic ogres. But all business now has a less favorable climate as far as the Federal Government is concerned.

The attitude at the top has changed and this will be reflected through all other echelons.

A suggestion: Take a look right now at every phase of your operation subject to government inspection, regulation or control, and presume controls will be tightened and act accordingly.

Effective date postponed for certain provisions of ice cream standards

Major portions of the Federal standards for ice cream went into effect October 25. FDA has, however, postponed the effective date of certain requirements of the standards — some of these until July 1, 1961, and others until court adjudication.

The provisions stayed until July 1 include the requirement for a minimum of 10% butterfat in ice cream and the entire standard as it relates to ice milk.

FDA said that these provisions of the Federal standard conflict with corresponding requirements of a number of states, and may create a hardship for small manufacturers within those states.

The extension was urged by state regulatory officials. It was agreed to in view of the probability that several of the states will amend their laws during their legislative sessions, scheduled for early 1961, to make them uniform with the Federal standard.

The requirements of the standards postponed pending court action include:

1. Certain provisions specifying the manner of label declaration of flavors.
2. Provisions prohibiting the use of whey in ice cream, frozen custard and ice milk.
3. Provisions requiring label

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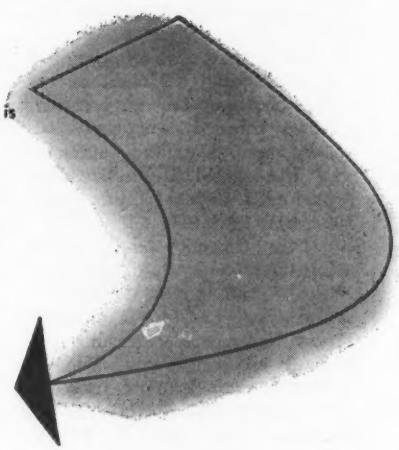
for fast, even feeding of freezer belts

Simplicity 18" x 11'-0" KA Stainless Steel Feeder Feeds 8,000 lbs. of Corn or Peas Per Hour—Entire Width of Freezing Belt

A problem familiar to all frozen food manufacturers is even distribution of product over the entire width of the freezing belt. This problem is solved with a SIMPLICITY Stainless Steel Feeder.

The feed end of the feeder is equipped with a 3 foot section of Bixby-Zimmer decking which dewaters the product. The remaining 8 feet of deck surface is slotted diagonally, allowing the peas or corn to be deposited at the correct depth and distributed across the full width of the freezing belt. The product flow is regulated by a gate, positioned along the diagonal slot, which is adjustable from a closed position to a 2 inch opening.

SIMPLICITY engineers are ready to help you on any food handling problem. Write Department 7 or call SIMPLICITY ENGINEERING COMPANY, DURAND, MICHIGAN. Phone 46.



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FOR CANADA: Simplicity Materials Handling Limited, Guelph, Ontario. • **FOR EXPORT:** Brown & Sites, 50 Church Street, New York 7, N.Y.

7063 on Reader Service Silp.

declaration of any whey used in fruit sherbets.

4. Provisions prohibiting the use in ice cream of skim milk products prepared by a treatment with mild alkalis.

FDA said that suits have been filed in the Courts of Appeals for the District of Columbia and in the Second and Ninth Circuits objecting to these provisions. Requirements of the standards on these points will therefore be held in abeyance until the courts have ruled on the questions, the agency said.

Another suit filed in the Court of Appeals for the District of Columbia protests the exclusion of certain neutralizing and buffering chemicals previously used to adjust the acidity of ice cream mix. FDA said it is not postponing the standard requirements on this point because it believes allowing use of these agents would make it possible to use sour dairy ingredients. This would be contrary to FDA's policy that ice cream should be made from fresh dairy ingredients, the agency said.

The petitioner has asked the court to grant a stay of the order to permit the use of the neutralizers until a final court ruling has been made. No action on this request has yet been taken by the court.

Other provisions of the standards which are now effective include a minimum weight per gallon and a minimum milk solids content for ice cream, and similar requirements for other frozen desserts to protect the integrity of the products, FDA said.

NCA canvasses industry on color additives

The National Canners Association has asked the industry for information on canned food ingredients which may be affected by the Color Additives Amendment.

The new amendment covers not only coal tar colors but any substance, natural or synthetic, capable of imparting color. The definition includes black, white, and intermediate grays as well as colors, and

continued on page 14

Plants, Companies, Personalities

Citrus Products Company

is planning an April 1 opening for its completely modern new plant located on an extensive site in Schiller Park, Ill., about 20 miles north of Chicago's Loop. The building will make possible a greatly increased production of flavors for KIST and CHOCOLATE SOLDIER.

Arkansas Rice Growers Cooperative Assn.

is building a $500,000 combined rice parboiling and milling plant in Stuttgart, Ark. An addition to the Cooperative's present Milling operation, the new plant is scheduled to go into production in February 1961, and will produce parboiled rice for the growing domestic institutional and consumer markets, and for export to India, where it is a favorite food.

Fisher Flouring Mills Co.

Seattle, fifth largest flour mill in the US, has elected 30-yr-veteran Kenneth R. Fisher vice president and general manager. He also will continue as company treasurer. Victor J. Evans, senior chemist in the Fisher laboratory, has been appointed chief chemist, replacing the recently deceased Arthur J. King.

Salada-Shirriff-Horsey Inc.

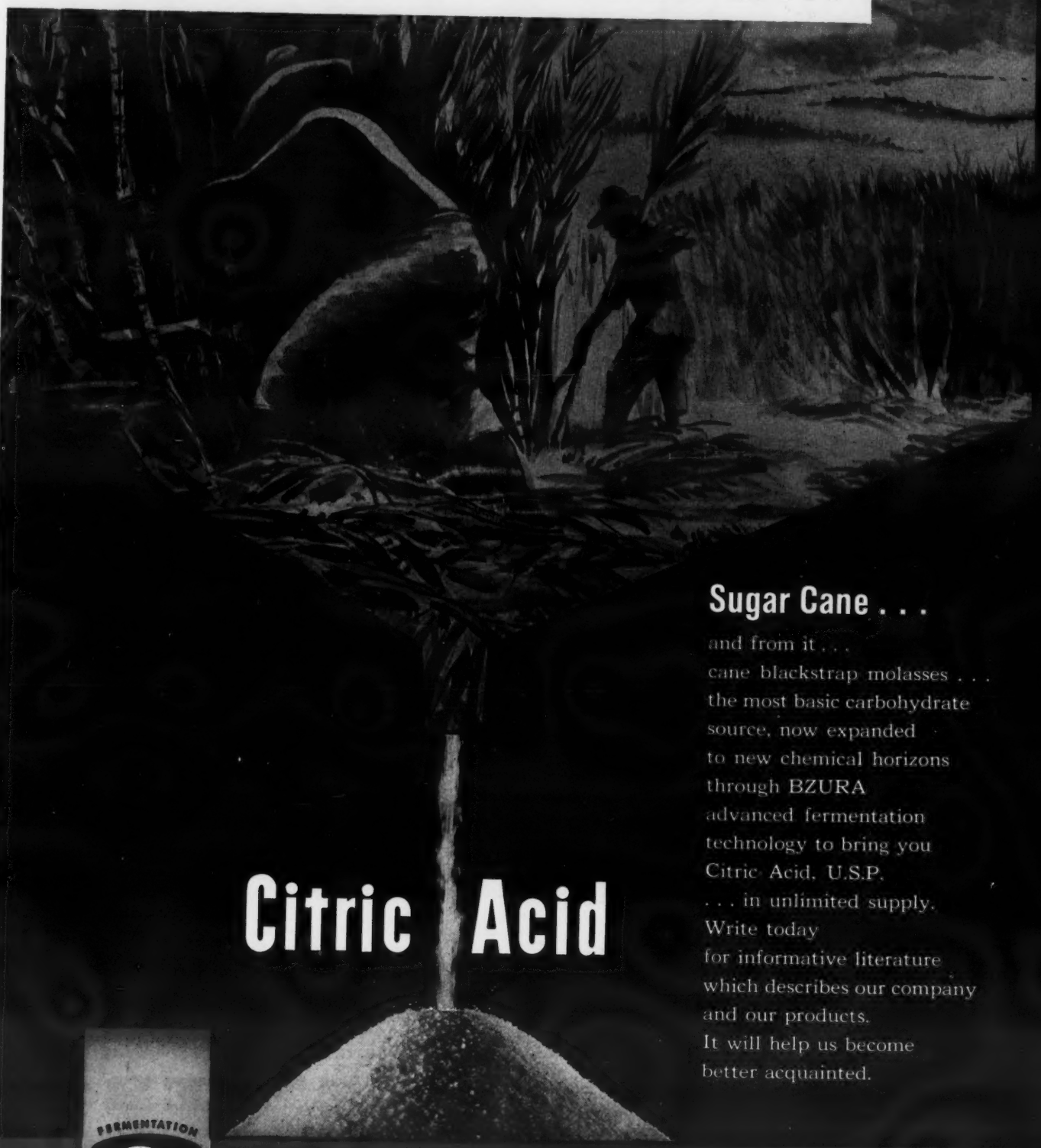
has appointed A. E. Beeby a vice president, and also general manager of the Salada-Junket Division headquartered in Woburn, Mass.

Green Giant Company

Le Sueur, Minn., has acquired Michigan Mushroom Co., Niles, Mich., packers of Dawn Fresh brand mushrooms, whose 1960 estimated sales will be $5 million.

For more information on product at right, circle 7064 on information request blank opposite last page.

Source unlimited...



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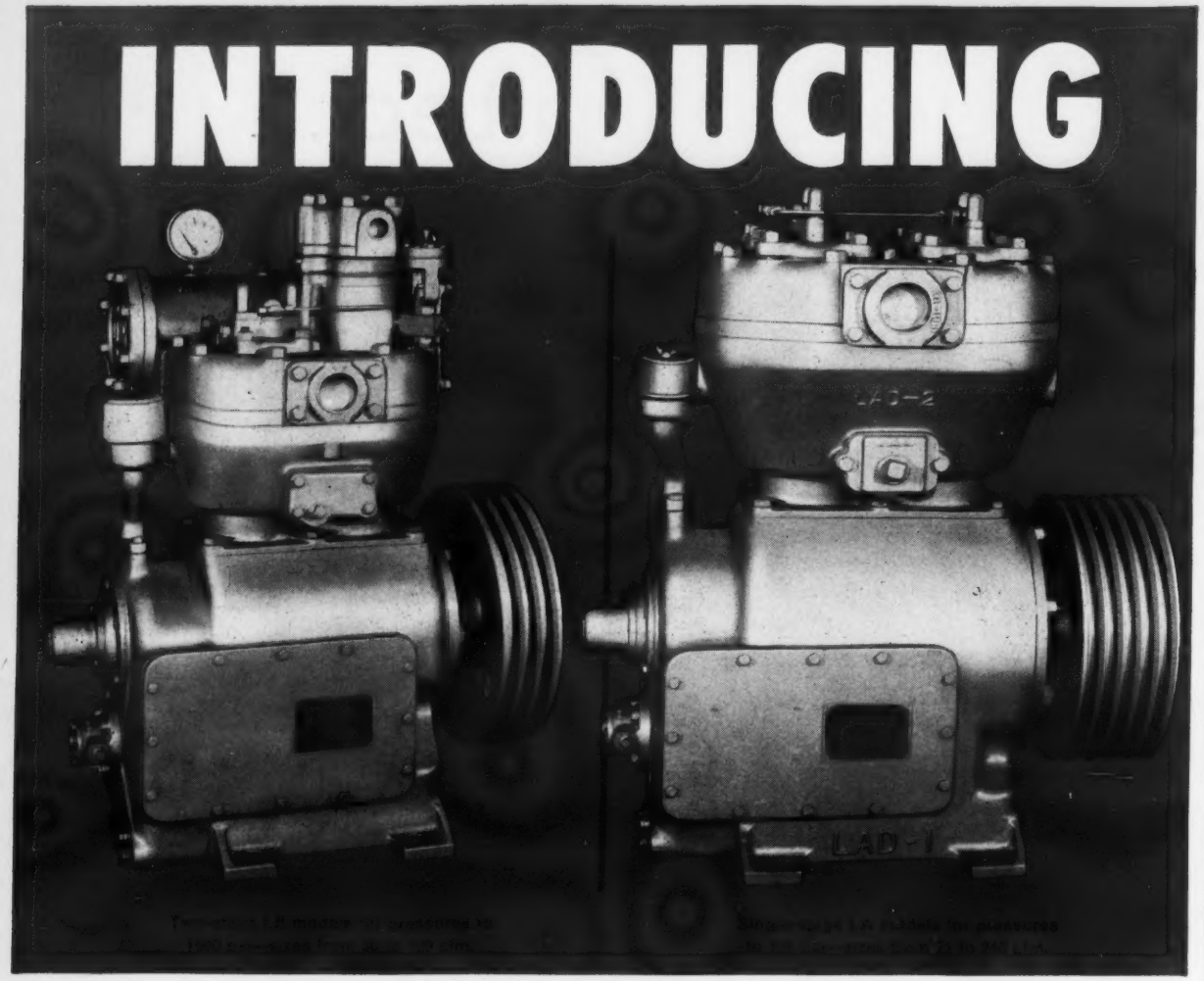

a new line of heavy-duty

GARDNER-DENVER COMPRESSORS

50 to 240 cfm piston displacement

Here are two new, compact Gardner-Denver air compressors designed for new efficiency and durability. Engineered interchangeability simplifies parts stocking. Built for years of continuous service, they require *only* routine maintenance.

Check these improved design features

NEW water-cooling design—gives more efficient use of power.

NEW positive pressure lubrication system to main bearings and connecting rods.

NEW bearings—adjustable, tapered roller bearings.

NEW aluminum pistons—lighter mass to start and stop . . . conserve power.

PLUS all the quality engineering you've been used to in Gardner-Denver compressors for nearly 100 years.

Get the complete story on these new compressors from your Gardner-Denver representative or write for Bulletin LA-1.

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

GARDNER - DENVER

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Ave., Toronto 16, Ontario

7065 on Reader Service Slip.

food regulations

continued from page 12

substances that may have functions other than their coloring effect.

NCA is looking for information of two kinds:

1. Substances used for their coloring effect, the maximum levels of use, and the period of such use.

2. Ingredients which, though capable of imparting or affecting color, are used solely for other purposes.

Earlier, NCA had petitioned FDA to issue a regulation that legal ingredients in standardized canned foods be exempt as color additives unless designated in the standard as coloring substances. This petition is still under study by the FDA.

New regulations under Additives Amendment

Glyceryl lactostearate and mono- and diglycerides: This additive is a mixture of mono- and diglycerides and their lactic acid monoesters, manufactured by glycerolysis of hydrogenated lard, tallow, cottonseed oil or soybean oil, and subsequent esterification with lactic acid.

It may be used as an emulsifier in or with shortening with the following provisions.

1. Total lactic acid content not to exceed 16%; acid number not to exceed 14.

2. Total free and combined lactic acid present not to exceed 1.75% of the combined weight of the shortening and the food additive.

Acetone peroxides: For use in flour and breads under certain prescribed conditions.

It must be used or intended for use:

1. In maturing and bleaching of flour in a quantity not more than sufficient for such effect.

2. As a dough-maturing agent in bread and roll production at levels not to exceed the quantity of hydrogen peroxide equivalent necessary for the artificial maturing effect.

For more information on product at right, circle 7066 . . . see information request blank opposite last page.

WARNER-JENKINSON MFG. CO
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CERTIFIED FOOD *Colors*

Tempting, eye-appeal attains its most potent sales effectiveness with Red Seal Colors of unsurpassed brilliance, purity and uniformity. Let Warner-Jenkinson produce—and precisely re-produce—the exact colors to give your products the greatest possible taste-stimulating attractiveness.

WARNER-JENKINSON MANUFACTURING CO.

Manufacturers of Certified Food Colors, Vanillas, Extracts, Flavors

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The big stumbling block to clearing additive petitions . . .

more suitable analytical methods for determining additives

Two out of three petitions submitted to FDA are rejected before they are ever filed — and more than two-thirds of those filed are returned to the petitioner. What's the major stumbling block in meeting petition requirements? FDA says it's methodology.

". . . . this problem of methodology is one which will occasion much concern and which will call for resourcefulness in analytical chemistry and other forms of analysis of the highest order," says FDA Deputy Commissioner John L. Harvey.

The fact does remain, Mr. Harvey continued, that the "very essence and key" to the success and effectiveness of legislation lies as much in the development of suitable methods for determining residues in or on food as provided for by the regulation as in the development of the all-important toxicity data showing that the amount is safe.

Methods proposed by food additive petitioners are tested in the laboratory by FDA chemists to determine whether they are practicable. Thirteen out of nineteen methods evaluated were initially rejected as impracticable on the basis of these studies.

What has been the nature of FDA's objections?

In one case validation data were offered on several foods. The petitioner made the statement that the method was generally applicable to all foods in which the additive was proposed for use.

FDA requested samples of one food covered by the petition on which the method had not been actually tried. The method failed completely; no recovery at all of the additive from the food could be obtained.

In "numerous instances" FDA has found it necessary to request the petitioner to revise his method to spell out in detail the procedural steps to avoid any misunderstanding by the chemist as to what is meant and thus to improve reproducibility.

Many of the proposed methods, FDA says, are very long, time-consuming, tedious and sometimes employ expensive equipment of a specialized nature.

Now under consideration by FDA, for example, is practicability of a method requiring 5 to 6 days of a chemist's time to make two or three single determinations.

Possibly each case will have to be individually considered. Factors involved would be these:

Is the additive so toxic as to require close policing or is there a wide difference between the actual usage level and the maximum safe tolerance level?

Is it an additive which is practically non-toxic where there is a question as to whether any tolerance is actually required to protect the public health — but where the question is to be resolved in favor of the consumer by setting a tolerance?

Is usage of the additive so self-limiting that no regulatory problem is likely to arise?

And, is there any reasonable expectation based on the chemistry that a more rapid method could readily be developed?

"I think we overdid the artificial flavoring."

Federal meat inspection extended to certain non-meat products

USDA's Meat Inspection Division has extended its service to include a number of products containing small amounts of meat or meat derivatives. These products are not classified as meat products.

Included in the new voluntary pay-as-you-go inspection program are such items as canned pork and beans, mincemeat, boullion cubes and meat sandwiches — frozen or fresh commercially prepared.

USDA says that a number of manufacturers of these products have requested Federal inspection in order to export the commodities or place them in certain domestic markets. Canada, for example, requires that beef boullion cubes imported from the US carry the Federal inspection mark. Some cities in the US have ordinances requiring inspection of meat sandwiches for sale to the public.

For additional information contact the nearest Meat Inspection Div., Office, USDA.

Protein obtained from rendering approved as food ingredient

A new USDA Meat Inspection Division order permits the use of partially defatted pork fatty tissue in the preparation of those types of sausage in which meat by-products are considered normal ingredients.

The amount used shall not exceed 15% of the meat and meat by-product portion of the formula. When used, this meat by-product shall be identified in the ingredient statement as "Partially De-

fatted Pork Fatty Tissue."

Partially defatted pork fatty tissue is derived from low-temperature rendering of fresh pork fatty tissue, exclusive of skin.

In the low-temperature rendering process, a development of The Sharples Corporation, raw fats are first roughly ground and then heated to a temperature not to exceed 120 F.

Fats, which are now fluidized, are then finely ground and further centrifuged to obtain the partially defatted pork fatty tissue.

Classified as a meat by-product, the partially defatted pork fatty tissue has a pinkish color and a fresh odor and appearance.

For more information on the process address The Sharples Corporation, 2300 Westmoreland St., Philadelphia 40, Pa. 7067 on Reader Service Slip.

Government wins misbranding case

The misbranding case against Lever's Light Spray (see August FP, Food Regs) has been decided in favor of the government. Before the court decree was entered, Lever Brother's Company had relabeled the product.

The decree, which read that the seized articles were condemned, was entered in the US District Court, Baltimore.

The court ordered that the seized articles be delivered to any nearby hospital, orphanage or similar institution. The case is now closed.

NEW ADDITIVE PETITIONS

Sodium aluminosilicate and sodium calcium aluminosilicate: For use in reinforcing pigments in rubber compounds and as filters and coating ingredients in paper for food packaging. (J. M. Huber Corporation, New York)

Azodicarbonamide: For use in flour as an aging or maturing agent, in an amount not to exceed 45 ppm (0.0045%),

A new bulletin gives information on MYVACET® Distilled Acetylated Monoglycerides, now approved for food use

Bulletin A-1 describes their advantages, includes a list of 69 pertinent scientific papers and patents, and a compilation of projected uses.

This information will be of interest to food processors in view of the recent official approval* of the use of these materials, up to 5% in finished foods, as a food coating agent, container component, equipment lubricant, or emulsifier.

*See Regulations of the Food & Drug Administration Sec. 121.1018

Other bulletins discuss specific applications of these interesting products

Foods in which the use of *MYVACET Distilled Acetylated Monoglycerides* would appear to be of greatest efficacy include poultry, frozen and processed meats, frozen fish, dried fruits, nuts and candies, and storage eggs.

Bulletins on each of these applications have been prepared to assist in new-product development programs. Poultry and meat uses may require further specific clearances from USDA; we shall be happy to assist our customers to get such approvals.

For copies of the bulletins, samples of different types of *MYVACET Distilled Acetylated Monoglycerides*, and quotations, write ***Distillation Products Industries,*** Rochester 3, N. Y. Sales offices: New York and Chicago • W. M. Gillies, Inc., West Coast • Charles Albert Smith Limited, Montreal and Toronto.

distillers of monoglycerides made from natural fats and oils

DPi

Also . . . vitamin A in bulk for foods and pharmaceuticals

Distillation Products Industries *is a division of* **Eastman Kodak Company**

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Now—one high-purity salt is ideal for virtually all foods made today. The salt is Sterling Purified Salt, always more than 99.9% pure sodium chloride (less than 30 ppm calcium and magnesium, less than 0.2 ppm trace metals). Meat packers prefer it for a wide variety of operations, including curing, pickling, flavoring—and find it compatible with all phosphates. Canners like the way Sterling Purified Salt always protects food flavor, color and texture. Bakers use it in preparing the sponge. Food processors find it eliminates any problem of oxidative rancidity in vegetable fats and oils caused by ordinary salts. The list could go on indefinitely—for Sterling Purified Salt is today's superior salt, the salt that consistently upgrades fine products. Try it on your lines. To order, contact International's local representative or the nearest district office: **Boston, Buffalo, Charlotte, Chicago, Cincinnati, Detroit, Newark, New Orleans, New York, Philadelphia, Pittsburgh, St. Louis.** Or write direct to International Salt Company, Clarks Summit, Pa.

NEW STANDARD OF SALT PURITY

INTERNATIONAL STERLING SALT SALT COMPANY

"A STEP AHEAD IN SALT TECHNOLOGY"

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or 2.02 grams per hundred pounds. It is also proposed to amend the definitions and standards for the various types of flours to permit use of azodicarbonamide as an optional aging ingredient in them. (Wallace and Tiernan, New Jersey)

Mixture of caustic soda, ethylene glyco monobutyl ether and ethylene oxide condensate: Employed as a continuous felt cleaner on paper-making machines. (Harry Miller Corp. Philadelphia, Pa.)

Ethylene oxide condensate: As a continuous felt cleaner on paper-making machines. (Harry Miller Corporation, Philadelphia, Pa.)

Diethylene glycol adipic acid polymer: As a component of adhesives for food packages. (Cambridge Industries Company, Inc., Cambridge, Mass.)

Mixture of sodium glucoheptonate with tetrasodium ethylenediamine tetraacetate and trisodium N-hydroxyethyl-ethylenediamine triacetic acid: For use in processing paper and paperboard used in food packaging. (Union Starch and Refining Company, Inc., Columbus, Ind.)

Sodium lauryl sulfate, toluene, methyl ethyl ketone and tetrahydrofuran: For use in coated cellophane for food packaging. (E. I. du Pont de Nemours and Company, Inc., Wilmington, Del.)

Calcium chloride double salt of di-calcium pantothenate: To establish a tolerance for use in foods. (Nopco Chemical Company, Newark, N.J.)

Pesticide handbook

"Pesticide Handbook—1960," edited by Donald E. H. Frear, lists names, active ingredients and manufacturers of over 7000 pesticide chemicals and equipment.

It also provides information on legal tolerances, uses, compatibilities and antidotes for all pesticides.

Handbook is available for $1.75 in paper-bound edition and $3.25 in cloth-bound edition from College of Science Publishers, PO Box 798, State College, Pa.

Mechanical harvester has blade in front to cut tomato vines at root level. Tine pick-up elevates vines to a shaking device which separates tomatoes and discards stripped vines. An inclined belt conveyor, arrow, separates leaves and tomatoes. Leaves are discarded at rear; tomatoes roll forward to cross-conveyor for hand inspection. After inspection, tomatoes are conveyed into trailer-mounted bulk bins which, when full are, placed on trucks by fork lifts for shipment to canary. Crew of 13, including fork lift driver, performs all necessary operations

One step further toward . . . machine harvesting of tomatoes

- **New strain of tomato plants**
- **Fourth new mechanical harvester**

MAJOR obstacle to mechanical harvesting of tomatoes on a commercial scale may have been overcome by a new strain of tomatoes, developed specifically for machine harvesting.

Plants of the new variety will produce a crop of round, tough-skinned tomatoes which will all ripen at about the same time. Thus, a whole field can be harvested by mechanical harvesters at one time. Tougher skin minimizes bruising associated with somewhat rougher handling by machines.

Tomato strain, which was developed by Professor G. C. Hanna, Vegetable Crops Department, University of California, Davis, Calif., will be available in limited quantities by 1961. If these plantings are successful, a majority of the industry could convert by 1962.

Mechanical harvesting of this round type has thus far been limited to experimental plots. However, some 13,000 acres of another variety which is pear shaped have been harvested this season by a new mechanical harvester.

Machine, see photo above, is the fourth of its kind to be introduced this year. (For three other mechanical harvesters, see pages 28-30, October, FOOD PROCESSING.)

By next season, when the new seed will be available, about 15,000 acres will be machine harvested, including both "pear shapes" and the new, round variety.

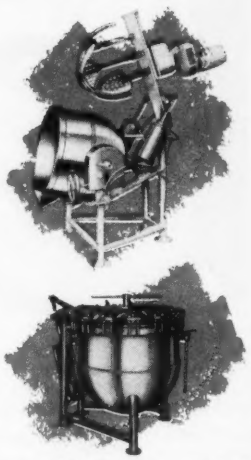
For the average tomato grower, the mechanical harvester is expected to pay for itself in one year.

Experimental pilot model of this machine was designed by Professor C. Lorenzen and S. Sluka, also of U.C. Field model was developed by Blackwelder Manufacturing Co., Rio Vista, Calif., which expects to be able to produce as many machines as will be needed for the 1961 season. END

There's nothing you can't process in a **GROEN** steam jacketed kettle!

FOR COOKING AND MIXING NUTRITIOUS FOODS faster...easier

Beef stew or baby food, chop suey or frozen dinners—wherever controlled cooking is combined with thorough mixing, Groen steam jacketed kettles will do the job better. Instantaneous heat transfer cuts processing time as much as 50%. The new Groen plant with its expanded production facilities is producing a greater variety of processing vessels than ever before. Our engineering and research departments are available to help you in developing custom equipment. Write for complete information on our standard equipment and special services.



Groen products include a complete line of tanks, coils, vacuum kettles, reaction kettles, revolving pans, tubular heat exchangers and pilot plant processing units.

GROEN MFG. CO.

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a little
cmc
makes
a

big difference

Here's a topper—cherry, whipped toppings, sprinkles, ice cream—enough to make any young man's eyes pop. In whipped toppings, cellulose gum, Hercules purified CMC, is used as a stabilizer.

Hercules cellulose gum is finding ever-increasing uses in a variety of food products because of its purity, consistent quality control and dependable supply. If you are a food processor you probably know about CMC. If you want to know more, we'll be glad to send you complete technical information on your requirements and work with you on your specific formulation if you request. For further assistance, write:

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VC60-9

Virginia Cellulose Department
HERCULES POWDER COMPANY
INCORPORATED
Hercules Tower, 910 Market Street, Wilmington 99, Delaware

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NATURAL VITAMIN C from Acerola

enrich your product
INCREASE YOUR SALES
use ACEROLA Concentrate
The nutritive juice of Barbados Cherry
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highest natural Vitamin C
Fortifies food and beverages

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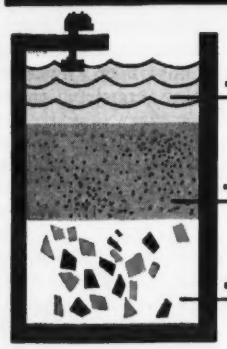

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... for grains

Positive measurement and control of material levels can be obtained with low cost W & C Prob-A-Larms.* Prob-A-Larms, are standardized capacitance type probes available in several local and remote models; All Prob-A-Larms are fail-safe.

WRITE FOR FREE CATALOG. *Trademark

Weighing & Controls
Industrial Park, Hatboro, Pa.
Division of
CompuDyne Corporation

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plants companies personalities

Daniel J. Bloch has been promoted to vice president of production for **Minute Maid International,** a subsidiary of Minute Maid Corp. He will direct the coffee and concentrate production operations in Mexico, El Salvador, Guatemala and Germany.

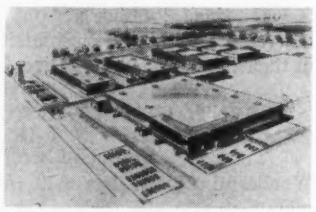
James Edward Welch has been appointed supervisor of Product Development and Quality Control for **Wm. Underwood Co.,** Watertown, Mass. He had been chief biochemist

J. E. Welch

W. L. MacNevin

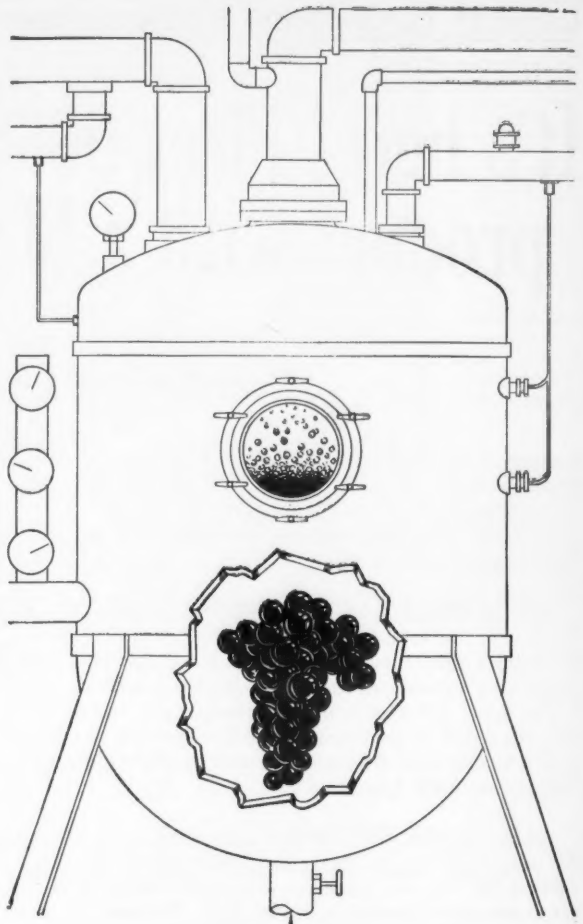
for the Maine Sardine Industry Research and Quality Control Laboratory. Underwood also announces promotion of **William L. MacNevin** to the position of chief engineer.

Merchants Refrigerating Co., New York, will begin operations early in 1961 at its vast new "Frozen Food City"—located at Secaucus, N.J., 20 min



from the heart of New York City. The establishment, on a 25-acre tract, will provide a completely integrated refrigeration program combining processing, warehousing and retail store distribution.

Massachusetts Institute of Technology will expand its pioneer teaching and research in the field of foodstuffs and nutrition by creating an augmented department, to be named Department of Nutrition, Food Science and Tech-



Real Fruit Flavors...

WITH THE FUGITIVE AROMAS CAPTURED!

You can improve your product amazingly—by use of FLAVOREX *real fruit flavors.* Our "Low Temp" process coaxes out and captures the very last drop of goodness in the natural fruit. Those delicately elusive, but important, volatiles now are collected and entrapped in our real fruit concentrates . . . so that all the full, rich, good taste goes directly into your product. Available—black raspberry, black cherry, grape, strawberry, blackberry, punch, lemon and orange—as real fruit pure concentrated juices. Or with other natural flavors for added strength. Write for samples and prices today.

Symbol of Fidelity

Better Flavors for Better Products

FLAVOREX CO., INC.
302 S. CENTRAL AVE., BALTIMORE 2, MD.

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It's here! First 90% pure protein dairy product with a bland taste and odor

Fantastic new dry milk protein has uses not yet discovered (do you have one?)

Sodium Caseinate was the protein dairy product with problems. Up to now, it did not lend itself to manufactured foods because of its flavor and odor.

Interest in sodium caseinate was high because of its high concentration of milk protein.

LAND O'LAKES GOES TO WORK

Because of this intense interest, Land O'Lakes Creameries in Minneapolis set out to produce an acceptable pure food product by eliminating its undesirable characteristics.

The Land O'Lakes team of chemists and technicians has succeeded in developing an edible sodium caseinate with a bland, clean taste and odor and creamy white color. And it's available now.

90% PROTEIN, 1½% FAT

At last, the dairy product the food industry has been waiting for. Sodium caseinate with many desirable characteristics. 90% protein. 1.5% fat. And it's manufactured from fresh sweet skim milk, not reprocessed casein.

8 AMINO ACIDS

Land O'Lakes sodium caseinate is rich in all the essential amino acids. 50 grams of Land O'Lakes sodium caseinate supplies more than the minimum daily requirements for adults of each of the 8 essential amino acids.

Lysine is one of the most sought after, and least available, of the amino acids. But Land O'Lakes sodium caseinate has it. 50 grams has more than four times the daily minimum requirements for adults!

'CUTS SHRINKAGE FROM COOKING TO A MINIMUM,' SAY SAUSAGE MAKERS

Land O'Lakes sodium caseinate greatly cuts down the loss of natural fats and juices in the cooking process of sausage. Why? Because it absorbs three times its own weight in water. Because sodium caseinate in sausage is an excellent binder. It's the next best thing to "sanforizing," they say.

Cereal makers discovered new way to boost protein in their product by adding Land O'Lakes sodium caseinate. Added benefits developed, too. The cereals toasted better, stayed crisp longer in the bowl.

Meat processors are at work this very minute seeking new uses for sodium caseinate, the wonder milk protein, in their products. Are you keeping up with their progress?

SYNTHETIC WHIP TOPPING DOESN'T FALL DOWN ON THE JOB, THANKS TO SODIUM CASEINATE

Wonderful response has come from synthetic whip topping manufacturers. They report sodium caseinate gives body and long life to their product. Its color is perfect. There are no odors or flavors to mask.

Can these applications of Land O'Lakes sodium caseinate offer a clue to new ones for you? Can you use this 90% dry milk protein in your products? Let us help. We'll work with you to build a better product.

Land O'Lakes. *New* Sodium Caseinate

Write, wire or phone. The number is STerling 1-4811. We will answer your questions fast, then wire your local Land O'Lakes representative immediately.

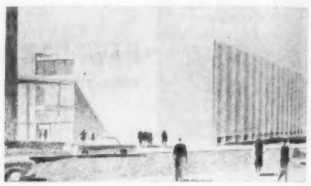
Land O' Lakes Creameries, Inc. • Minneapolis 13, Minnesota

7075 on Reader Service Slip.

plants companies personalities

nology. The enlarged department will be formed around the existing 33-yr-old Food Technology Dept. Head of the new department is one of the world's foremost nutrition authorities—**Dr. Nevin Stewart Scrimshaw,** director of the Institute of Nutrition of Central America and Panama(INCAP). Dr. Scrimshaw will maintain an association with INCAP as a technical director.

Construction has begun recently on a new Nutrition Research Building for the Harvard School of Public Health, Boston. Made possible through a gift of $102,600 per yr for 10 years from **General Foods Corp.,** the building will permit



studies applying biologial and medical sciences to human nourishment and its relation to heart disease, obesity and other health functions. An additional grant from the National Institute of Health (U. S. Dept. of Health, Education, and Welfare) Research Facilities Branch, in amount of $529,000, has been awarded for financing construction of the building.

Idaho Fresh-Pak Potatoes, Inc., has begun production of flakes and slices at a new Lewisville, Idaho, half-million-dollar potato processing plant. Named as general manager was **Warren Denning,** for 20 years in top posts with Rogers Brothers' dehydrating division.

A. A. Winston, recently research manager for General Foods' Franklin Baker operation in Hoboken, N.J., has been named research manager for the company's Perkins-S.O.S. division, Chicago, which produces, among other products, Good Seasons Salad Dressing Mixes and Kool-Aid Soft Drink Mixes. Stan Raf-

fensperger, who has headed Perkins' applied research, will continue in this activity.

A. A. Winston

G. Janner

Plant Industries, Inc., Plant City, Fla., a controlled subsidiary of Salada-Shirriff-Horsey Ltd., and pioneer developer of "instant citrus juices" in the form of pure crystals, announces appointment of **J. William Horsey** as board chairman, and his succession as president by **George Janner,** formerly vice president and general manager. **T. W. Griggs,** formerly marketing manager, has been promoted to Janner's former post.

Leo J. Amorosi, with the company since 1944, has been named director of the Essential Oil and Aromatic divisions by **The Norda Essential Oil and Chemical Co., Inc.,** New York City.

Libby, McNeill & Libby has centralized research activities to concentrate on two areas of the company's broad-scale research program — food technology and agricultural research. **J. W. Hanley,** formerly concerned with new product planning, has been named di-

J. W. Hanley

C. L. Andres

rector of Food Technology Research. **C. L. Andres,** formerly an administrative assistant to the vice president, has been named director of Agricultural Research. Both will report to Dr. R. M. Schaffner, vice president of research.

Yarway Series 40 Impulse Steam Traps on stainless steel cooking kettles

YARWAY news briefs

from **Yarnall-Waring Company,** *Philadelphia 18, Pa.*

BRANCH OFFICES IN 19 UNITED STATES CITIES • SALES REPRESENTATIVES THROUGHOUT THE WORLD
STEAM TRAPS STOCKED AND SOLD BY 270 LOCAL INDUSTRIAL DISTRIBUTORS

Lady's Choice Foods plant superintendent, Jack McFeron, checks valve on return line from Yarway traps

CAPACITY—PLUS

Yarway Series 40 traps feature not only high capacity, but also *high temperature discharge characteristics, excellent low pressure operation, no airbinding, operation against back pressures up to 40%, stainless steel construction.*

WHAT'S COOKING?

More than 3 times as much production with Yarway Impulse Steam Traps

Main objective of a recent modernization program at Lady's Choice Foods, San Leandro, Calif. was more production—and they got it!

One vital modernization step was the selection of Yarway Series 40 Impulse Steam Traps instead of old-style bucket traps formerly used. Yarway Series 40 traps, designed especially for high capacity applications like the cooking kettles in this plant, were selected for (1) their effectiveness and (2) their small size which enabled them to fit into the new compact piping layout.

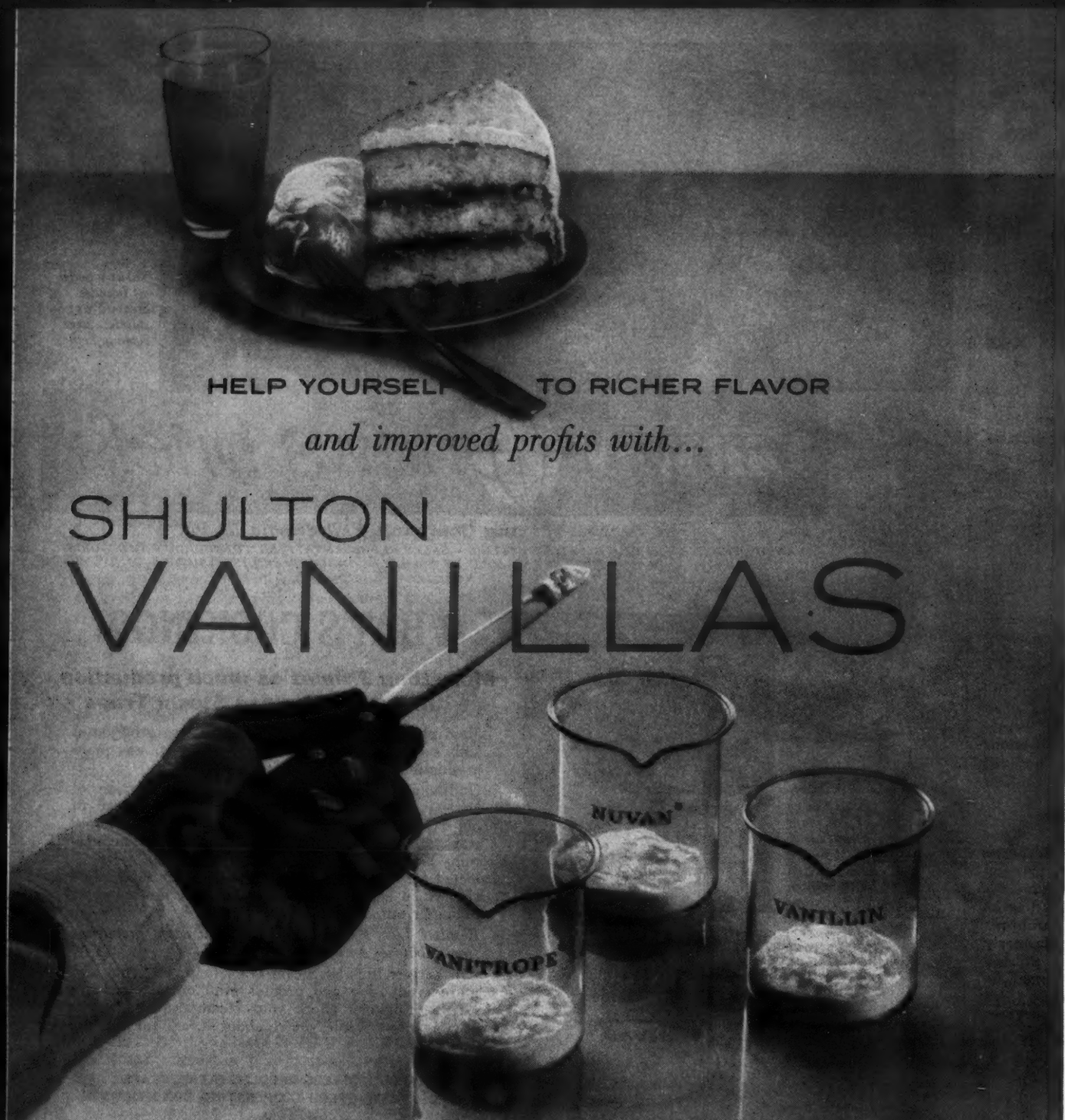
Results? Lady's Choice Foods has increased production from 2 batches a day to 7 batches a day.

Can Yarway Impulse Steam Traps help you "cook up" more production and profits? Find out by letting a Yarway Engineer check your steam trapping. Write Yarway now. While you're about it, ask for Bulletin T-1743.

YARWAY OFFERS IMPULSE STEAM TRAPS FOR THESE SPECIFIC OPERATING CONDITIONS

AVERAGE CONDENSATE LOADS	EXTRA HEAVY CONDENSATE LOADS	LIGHT CONDENSATE LOADS
Series 60	Series 40	No. 30

7076 on Reader Service Slip.



Imagine the classic flavor of the cured vanilla bean...and you have defined Shulton's true-to-nature vanillas. Shulton's VANILLIN USP is a standard for quality and blendability. VANITROPE® (up to 25 times stronger than Vanillin) also enhances flavors, gives you greatest economy. Now available are versatile NUVANs®... blends of Vanillin and Vanitrope...so adaptable for quality vanilla effects, and even more economical than Vanillin. Whether it's chocolate—cookies—ice cream—cakes...you can make it better with Shulton vanillas. And save up to 50% or more in flavoring costs. Why not write for information and samples today?

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For more information on product at left, circle 7077 see information request blank opposite last page.

THE MAGAZINE OF APPLIED TECHNOLOGY
FOR MEN WHO MANAGE
FOOD PROCESSING
DECEMBER 1960
VOL. 21 NO. 12

Last month, Robert N. Johnson, chief chemist of the Kroger Company, told how this major processor is meeting Additives Law packaging requirements in a manner typical of the food industry — by placing burden of proof on suppliers

Here, a leading supplier considers

The impact on packaging of the additives law*

ADOLPH MILLER, Director
Research and Development
Milprint, Inc.

An initial effect of the law will be to increase power of the chemical industry over the packaging materials industry.

Where new chemicals are found having unique effects, or new uses of old chemicals give similar effects — thus yielding the package supplier a proprietary item — if the chemical company producing the raw materials does not wish to develop the information needed for proof of safety, the package supplier must do it himself or abandon a proprietary position.

Second, it will, at least initially, slow down the pace of new developments because of additional costs and time consumed in development.

Third, it will be used, with varying degree of success, as a competitive weapon.

Organizations equipped to gather data required to obtain approval of the Food and Drug Administration for their materials will be in better position to promote sale of these materials to the packaging industry than those not equipped to accumulate the needed data.

The Law thus will militate in favor of larger companies with greater resources and against those not having the financial strength to support a program of toxicological investigation.

Fourth, among those suppliers of packaging materials in position to do so, there will be a tendency to develop products having application outside of food packaging, so that it will not be necessary to contend with requirements of the Law.

Last, because of increased development costs and broadened financial responsibility placed on suppliers in the form of guarantees, packaging costs will tend to rise. These added costs will be reflected in rising prices of finished products to consumers.

THE CONCLUSIONS just stated follow from a consideration of the problems thrust on industry by the Additives Law. These problems are dual in nature—technological and economic.

The packaging material for a food product falls under the jurisdiction of the Law only if some component of the package becomes part of the food. If no transfer from the package occurs, the package is not the concern of the Law and could conceivably be constructed of known poisons—yet be legal.

But here the first technological problem arises. How does one prove that *no migration* occurs?

The Food and Drug Administration has set up a series of simulated food solvents and a procedure for performing extraction tests under conditions representing the most severe usage of the packaging material. From these tests, conclusions are to be drawn as to whether extraction occurs, and how much.

Using these solvents, it becomes simple enough to determine a total extract. The problem arises when one must identify *what* has been extracted — particularly when one is dealing with organic plastics in the form of coatings, adhesives or films.

Just what is migrating? In most instances, the plastic itself does not consist of a single chemical species. It will cover a range of molecular weights,

continued on page 34

*Based on paper presented by Mr. Miller at the annual Packaging Institute Forum, Hotel Statler-Hilton, New York, Nov. 2, 1960.

Major advance in aluminum can production!

Mass produce aluminum cans from precoated foil

- ✔ **Lining remains intact throughout the draw process**
- ✔ **Cost competitive with similar standard tinplate cans**

A FULLY MECHANIZED process for making drawn, precoated aluminum cans, and a new easy-open aluminum top are major developments capping more than two years of research and development by Central States Can Corporation, working with E. W. Bliss Company and Kaiser Aluminum.

Completely automatic — with only one operator and a packer — the line produces 200-240 cans per min of three basic sizes: 2½ in. diam by 1½ in. high, 2½ in. by 2½ in. and and 3-7/16 in. by 1-13/16 in.

The equipment is capable of producing sizes to 3-7/16 in. diam by 3⅜ in. high. With modifications, the line has a potential production rate of 400 cpm.

Use of precoated stock eliminates coating and baking of cans — making the containers competitive with tinplate cans.

The heat developed in the drawing operation causes the specially formulated plastic coating to flow with the metal during the draw and redraw operations.

Coating now being used has been tested successfully with tuna fish, potted meats, liver spread, barbeque beef, chicken, smoked ham, smoked turkey and cheese products.

Three major machines comprise the line, with overhead conveyors connecting the operations. The first unit — a Bliss 60-ton Single Crank Press, on permanently inclined legs — blanks and draws a cup from the coil stock at 65-70 strokes per min, with a triple-cavity die.

The press produces a draw up to one-half the diam of the final can. (In the case of small cans — for example, the 3-7/16 in. diam by 1-13/16 in. high can — the draw is completed at this stage.)

Discharged from the blanking-drawing press in random positions, cups are aligned in open-end-up position in an unscrambler and are conveyed either to a redraw press, or, in the case of the smaller cans, directly to the trimmer-flanger.

The new Bliss 376 Rotary Redraw Press — reported to be the first of its kind — is a four-station, cam-operated unit that operates at 50 or more rpm. Cups are picked up by a star wheel and placed in the die, where they are drawn to final depth and diam.

Another star wheel pushes the can into the discharge conveyor for transfer to the third unit — the Bliss 366 Combination Trimmer and Flanger.

This six-spindle machine, operating at 33-1/3 rpm, receives can bodies via a star wheel, and holds them in position by vacuum for the trimming knives and cutters, and the flanging tool. Completed cans then are conveyed to packing.

For cans that will have a tear-strip top, another operation is involved. These cans are conveyed from the trimmer-flanger to a rotary machine which curls the flanges in preparation for crimping the top to the body.

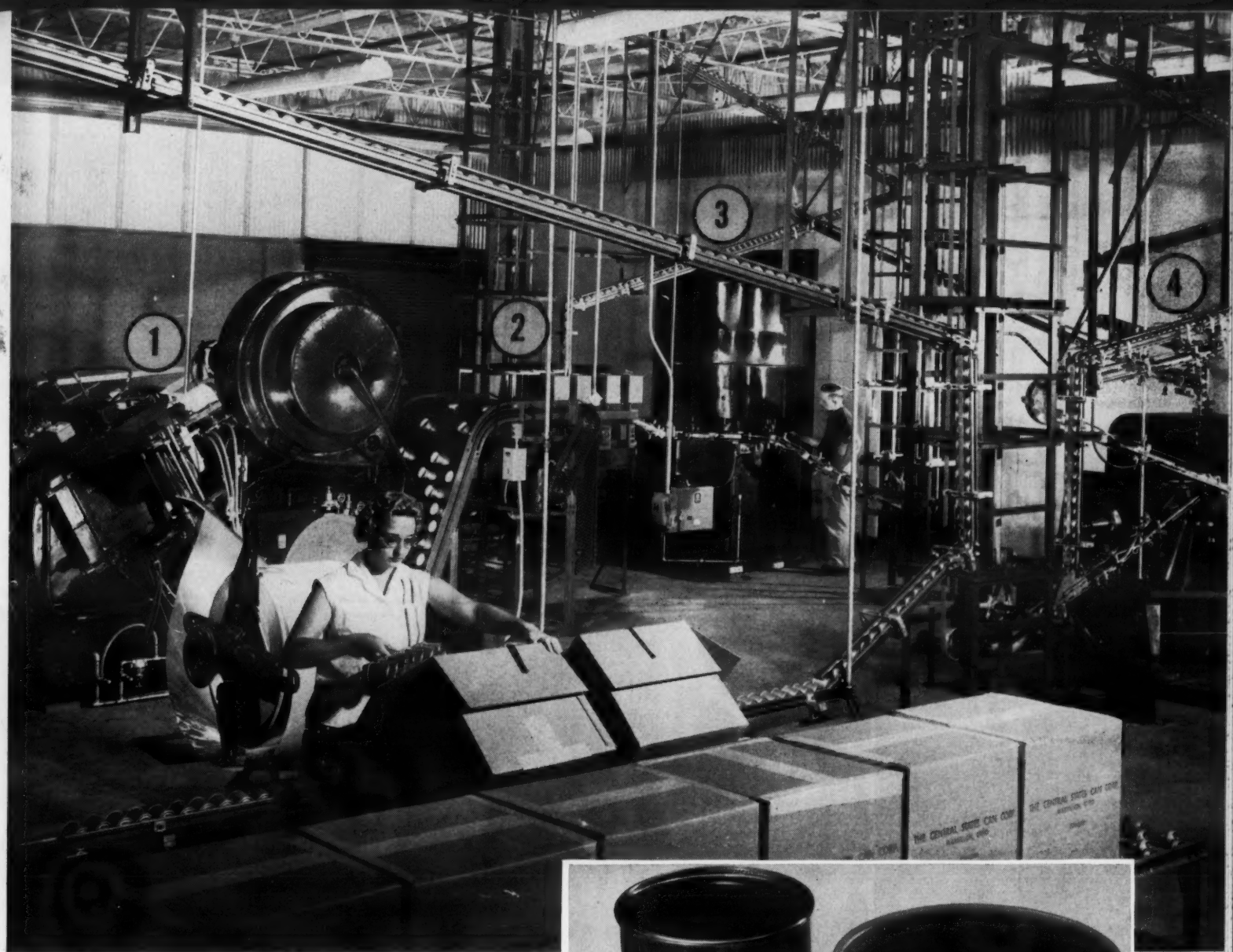
Covers for the other aluminum cans are conventionally produced, and normal double-seaming operations are required for closing. END

Optional Feature!

NEW, EASY-OPEN ALUMINUM TOP

. . . for round aluminum or "composite" cans

New aluminum lid system embodies a tab which is pulled to remove the lower seam of the lid, allowing top to be removed easily. Tear strip is so constructed that there are no sharp edges remaining on the rim, eliminating danger of cut fingers. Lid itself has a deep, countersunk shape — allowing it to be placed back on the can as a snug-fitting plug. The new opening principle is adaptable to round aluminum cans, as well as to composite cans which have aluminum tops and bodies of other materials — such as fiber.



Over-all view of Central States' fully mechanized aluminum can line shows blank and draw press (1), can unscrambler (2), specially designed rotary redraw press (3) and trimmer and flanger (4). Except for case packer (foreground), only one operator handles entire can-making operation

Drawn aluminum cans like these nest well for stacking, as can bottom fits recess in lid of can below. Note also how tear-strip tab of optionally available easy-open can at right lies flat against side of the sealed can

Aluminum cans and tear-strip aluminum cans by The Central States Can Corp., 1801 Harsh Ave., S.E., Massillon, Ohio. 7078 on Reader Service Slip.

Equipment for manufacture of aluminum cans and tear-strip aluminum cans designed, engineered and manufactured by E. W. Bliss Co., 1375 Raff Rd., S.W., Canton 10, Ohio. 7079 on Reader Service Slip.

Can unscrambler and conveyors at Central States Can Corporation by Great Lakes Runway & Engineering Co., 4137 N. Rockwell Ave., Chicago 18, Ill. 7080 on Reader Service Slip.

Density unit is located on third-stage recycling leg (arrow), controls 3-way valve from product discharge pump

On-stream analyzer has shielded gamma-ray source (right) on one side of product line, detector element on other, plus conduit to controller

Application of atomic-particle emission is not limited to liquid density measurements. Two other nuclear gages which measure moisture and density of granular solids are described in an article starting on page 81.

'Closed loop' density control for juice evaporation saves up to $6000/year

Dial desired density—obtain product to ±½° Brix: Gamma-ray gage system easy to clean, maintain

HARRIS KIESER, Production Superintendent
Lemon Products Division, Sunkist Growers
KARL ROBE, Associate Editor

Problem: Control of density of lemon concentrate from three-stage Mojonnier evaporator had been accomplished for several years by an automatic gravimetric device at Lemon Products Division of Sunkist Growers, Corona, Calif.

Mechanical action, subject to wear and consequent changes, resulted in readings which were as much as 2° Brix too low much of the time. Consequently, extra reblending labor was required on finished product to bring it to desired Brix.

Solution: An Ohmart density gage which uses a gamma-ray source was installed on recycle leg from third stage of evaporator.

Gage uses a patented detecting cell which converts gamma radiation directly into electrical energy. As density (amount of product in the unit of pipe volume scanned) changes, product offers more or less resistance to gamma-ray flow between source on one side and detector on other.

Electrical signal from detector cell is transmitted to controller. If product is of lower Brix than set point, it is recycled to evaporator.

When product reaches desired density, controller opens a three-way valve to transfer finished product to storage area.

Sunkist normally operates in the 35° to 50° Brix range. Controller range is from 3° to 70° Brix, which allows Sunkist to operate in midrange for highest accuracy.

To change from one desired density to another, operator merely turns knob on controller. Operation then controls itself.

Gamma source has half-life of 33 years, can be replaced in 5 to 10 years if necessary.

Calibration: 6-month intervals

Calibration is simple: An equivalent-density screen made of lead is placed between radiation source and detecting cell, with no product present.

A simple screwdriver adjustment controls the radiation from a comparator radiation source, which is a longer-lived emitter (100-yr. half life). This adjustment provides zero suppression current at density being checked.

A series of lead screens, equivalent to several densities, are used. Entire three-step equivalent-absorber calibration method takes only a few minutes.

Gage has been remarkably maintenance-free, and calibration is required only at approximately six-month intervals.

Results: Controller is accurate to ±½° Brix, based on actual commercial operation.

Concentrate of specified Brix can now be produced and shipped with minimum blending correction needed to overcome density variations.

This results in an increased capacity per man hour, with savings calculated at an approximate rate of $6000 per year.

Gage has no moving parts, so uncontrollable drifting from mechanical wear is eliminated.

Since sensing element is on outside of product tubing, it does not interfere with regular cleaned-in-place cleaning of evaporator, whereas former device required special attention and cleaning techniques after each run.

Ohmart Gamma-Ray Density Gage is product of the Ohmart Corp., 2242 Bogen St., Cincinnati 22, Ohio.

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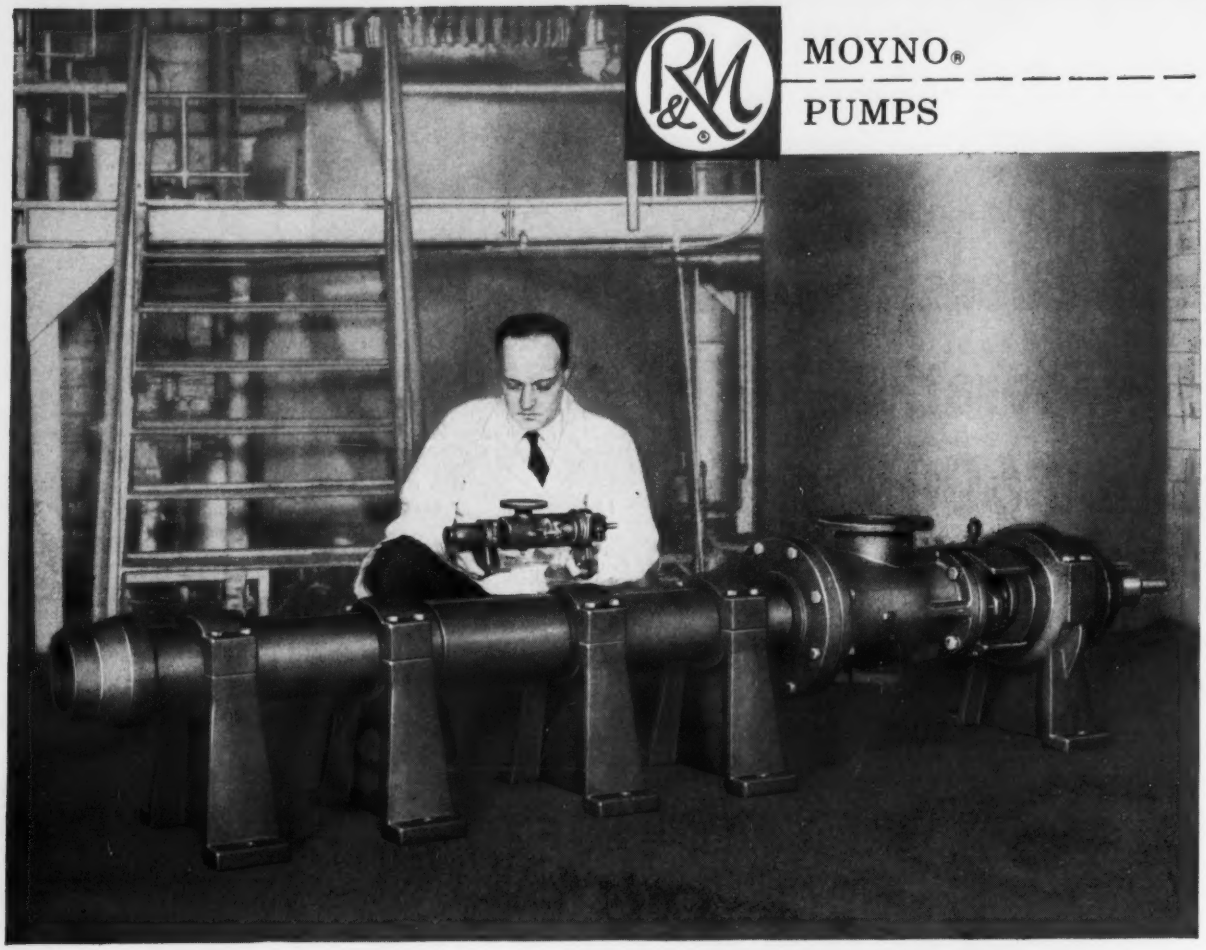

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PUMPS

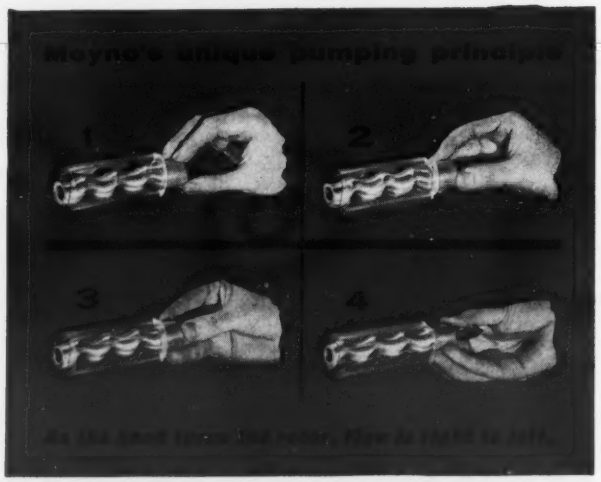
MOYNO® PUMPS

capacities: from 1/100 to 500 gpm
pressures: up to 1000 psi

MOYNO pumps are available in nine sizes with capacities ranging from minimum metering flow to 500 gpm and pressures from zero to 1000 psi. Positive displacement delivers uniform discharge without pulsation, agitation or turbulence. Solutions ranging from thin watery slurry to extremely viscous paste, corrosives, abrasives and even solids in suspension are economically handled without excessive pump wear.

MOYNO'S unique *"progressing cavity"* principle with only one moving part and special resistant internal parts slashes pump maintenance costs on problem materials that often ruin other pumps. Almost any substance that can be forced through a pipe can be pumped by a MOYNO.

To learn how a MOYNO can cut your pumping costs, write today for Bulletin 30-FP



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Food processors get 1/5 of each dollar spent for farm food products

According to a new USDA technical bulletin, food processors get about 20 cents out of each dollar spent by American consumers for farm food products.

Factory production of processed farm foods, according to this bulletin, increased at the rate of 2.6% per year between 1947 and 1958. This rate of growth was slower than during World War II, but substantially faster than the average annual rate in the prewar period, 1909 to 1939.

Included in the report is an Index of Factory Production of Domestic Farm Foods. It begins in 1909 and covers major categories of food, including meat, fruit and vegetables, dairy products and cereals.

A copy of the report, Technical Bulletin No. 1223, "Output of Factories Processing Farm Food Products in the United States, 1909-58," may be obtained from the Office of Information, US Department of Agriculture, Washington 25, District of Columbia.

All about making flavors

"Food Flavorings, Composition, Manufacture and Use," contains 21 chapters in 381 pages with illustrations. The book is divided into three sections.

I.—Natural flavorings from fruits, vegetable plants, spices, cocoa, coffee and vanillas are covered in a clear step by step description of manufacturing.

II.—Flavor additives or aromatic chemicals are described. Also a chapter covers certified food colors and regulations governing them.

III.—The section on uses covers all of the major uses of food flavors and colors in detail.

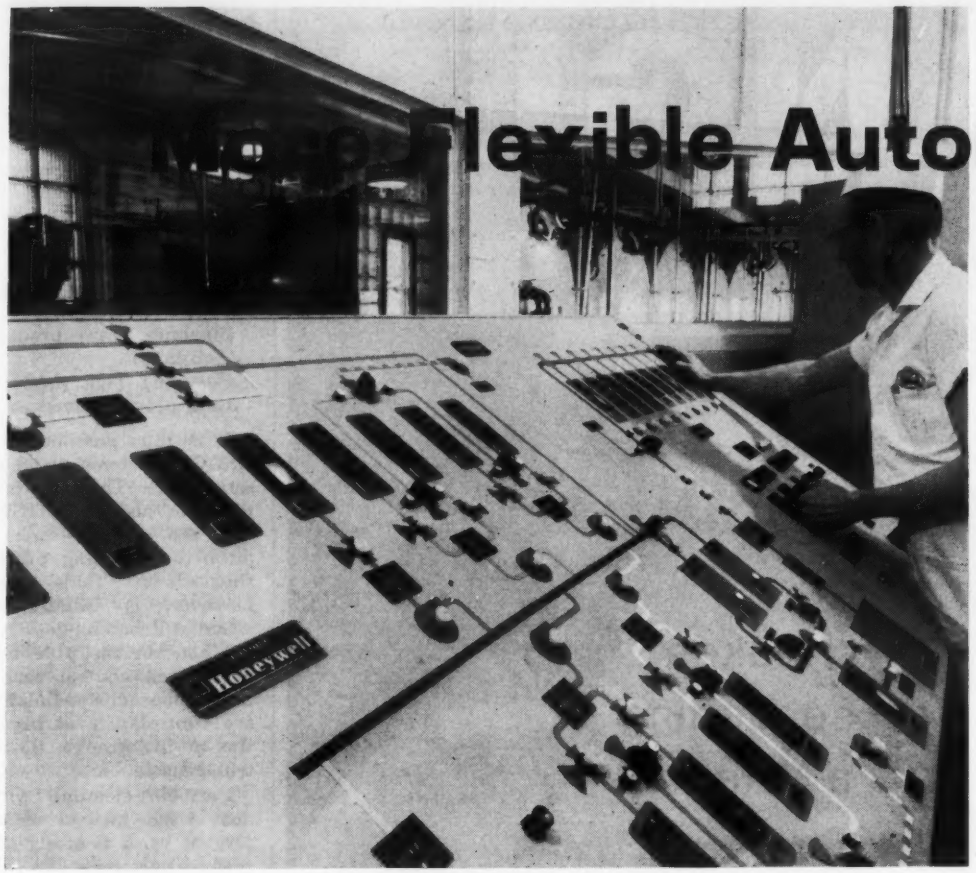
The author, Mr. Joseph Merory, is a food chemist and president of Merory Flavors Inc., Boonton, New Jersey. His book is available from The AVI Publishing Co., Inc., P.O. Box 388, Westport, Conn., at domestic price of $12.50 and foreign price of $13.50.

AUTOMATION
AT HOOD DAIRY — V

Flexible Automatic CIP

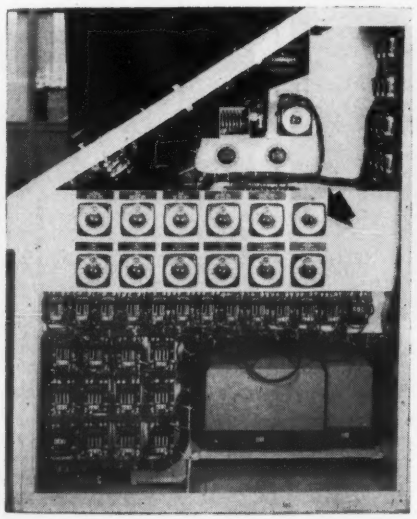
- **Each step independently adjustable**
- **Five systems controlled from single panelboard; two can be operated at same time**
- **Economical — reuse tank final rinse water as prerinse for next tank**

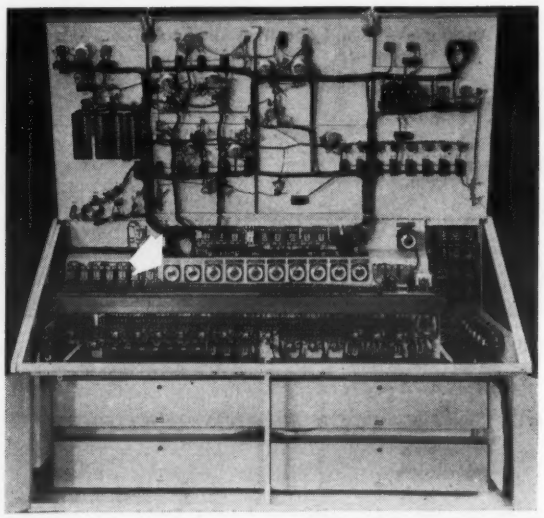
HOWARD P. MILLEVILLE
Editor



Control for all five CIP systems is centralized at the graphic flow control console, which portrays the entire mix process including tank levels, valve positions, and pump operations. There are two CIP solution mixing stations for the five CIP systems: #1 — flavor dept tanks, HTST circuit; #2 — raw product pipelines, pasteurized product pipelines, and raw product tanks.

Timing controls are accessible at the side of the console for one of the CIP mixing stations and underneath the top of the console for the other — see arrows in illustrations. Two of the CIP systems (one from each station) can be in operation at the same time.





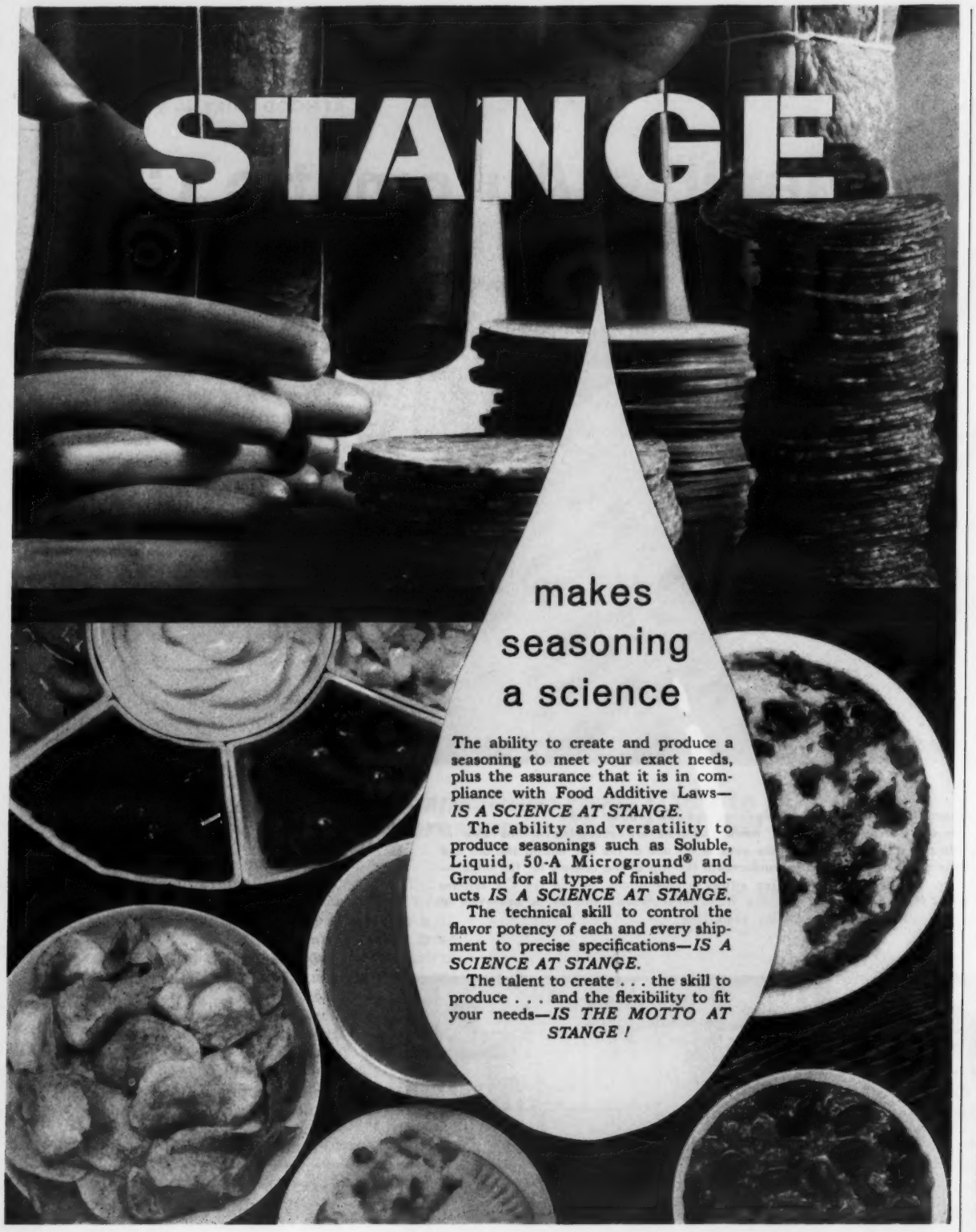
INNOVATIONS in automatic CIP at H. P. Hood & Sons Boston plant are perhaps not as dramatic as the other features of their automatic ice cream mixing operation,* but they are none the less newsworthy.

One of the features is the use of the final rinse water as the prerinse, in sequential cleaning of the tanks. Since there are nearly 40 tanks cleaned, the savings in labor are appreciable. The labor was reassigned to other jobs in the plant or absorbed through turnover.

Built into the controls is the sequence of CIP steps; however, the time allotted to each step is independently adjustable. (The timers are easily accessible — see illustrations at left.)

There are two CIP solution mixing stations and five separate CIP systems controlled

* See the four preceding articles in this series which appeared in September and November FOOD PROCESSING.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seasoning
a science
The ability to create and produce a seasoning to meet your exact needs, plus the assurance that it is in compliance with Food Additive Laws—IS A SCIENCE AT STANGE.
The ability and versatility to produce seasonings such as Soluble, Liquid, 50-A Microground® and Ground for all types of finished products IS A SCIENCE AT STANGE.
The technical skill to control the flavor potency of each and every shipment to precise specifications—IS A SCIENCE AT STANGE.
The talent to create . . . the skill to produce . . . and the flexibility to fit your needs—IS THE MOTTO AT STANGE!

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CREAM OF SPICE SOLUBLE SEASONING® PEACOCK BRAND CERTIFIED FOOD COLOR®

7083 on Reader Service Slip.

The CIP systems and the graphic flow control at Hood were designed and constructed by the Brown Instruments Division of Minneapolis-Honeywell Regulator Co., Wayne and Windrim Avenues, Philadelphia 44, Pa.
7084 on Reader Service Slip.

from the graphic flow control console as follows:

Solution tank #1
- Flavor dept tanks
- HTST circuit

Solution tank #2
- Pipelines, raw product (5 circuits)
- Pipelines, past product
- Raw product tanks

It is thus possible to have two CIP systems going at the same time. The raw product pipelines and the HTST circuit are cleaned each night after the batching process is shut down. Tank cleaning, however, is usually begun while still batching.

Whenever desirable, the operator can control each step of the operation manually. All the controls are at his finger tips at the graphic flow control console.

Periodic cleaning with an acid wash instead of a detergent wash is easily accomplished by means of a selector switch.

Detergent, acid, sterilizer are all metered automatically into the CIP solution mixing tanks. Temperature is automatically controlled by introducing steam into solution as required. Valves are automatically pulsated to expedite the cleaning.

This CIP system has now

Operator is making field connection for CIP circuit. Interlocks, which are visible on connecting station in lower left of photo, prevent start up of CIP until proper connections are completed

been in operation 12 months and has enabled Hood to up the productivity of labor. It has made working conditions for people directly concerned with cleaning operations much better. Damage to equipment has been reduced through elimination of manual handling of valves and pipe. Housekeeping, as a result, has also been improved. END

Reviews use of fats in livestock feeding

Fats from a nutritional viewpoint are high-energy foods. Yet, their use as an additive to livestock feeds was not common in this country before 1954.

Today, however, some 500 million pounds of tallow and grease are used in livestock feeding. To aid those engaged in the preparation or use of feed containing fats, a comprehensive review of available information is presented in 44-page Utilization Research Report No. 2.

Pointing out the potential advantages of adding fats to feeds, booklet, Utilization of Fats in Poultry and Other Livestock Feeds, is divided into two sections: technology of using fats in feeds and animal feeding with fat-supplemented feeds.

In first section, grades and qualities of fats, antioxidants and keeping qualities, as well as storage, handling and mixing of fats in feeds is discussed.

Second section of booklet takes up in some detail supplementing feeds with fats for such poultry as chickens, turkeys, geese and ducks, and such farm animals as beef cattle, dairy cattle, calves, lambs and sheep.

Feeding dogs and minks with fat-supplemented feeds is also discussed.

Booklet was written by Waldo C. Ault, Roy W. Riemenschneider and Donald H. Saunders of the Eastern Regional Research Laboratory, Eastern Utilization Research & Development Div., USDA.

Literature may be obtained by sending 25¢ to Superintendent of Documents, US Government Printing Office, Washington 25, DC.

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Our men don't travel by parcel post, but if you think we're joking about sending a technical man, you are absolutely wrong.

We have a wonderful new product which must be actually tried to be appreciated. It is Tora Food—our name for our superb, primary-grown Torula Yeast U.S.P.

Tora Food has an amazing ability to accentuate and improve natural flavors. So chances are very good that it will improve the flavor of your products.

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Sure, I'd like to find out how Tora Food will improve our products.

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- ☐ Please send me a complimentary sample of Tora Food.
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DIAMOND CRYSTAL FLAKE-TYPE SALT WILL ENHANCE THE QUALITY OF YOUR FOOD!

Diamond Crystal Salt is made by the exclusive Alberger process which produces a flake-type salt that is uniformly 99.95% pure. This amazingly high purity combats the danger of costly spoilage . . . helps prevent "off flavoring". . . and protects and enhances the quality of your product.

Diamond Crystal Flake-type Salt permits "maximum salting" for best flavor development in your product without the bitterness that is imparted by ordinary salt containing calcium, magnesium and metallic impurities. A less pure salt than Diamond Crystal Flake-type could form unappetizing scums and discolorations on vegetables, or stimulate oxidative rancidity in foods containing fats and oils.

Diamond Crystal Flake-type Salt is precision screened to provide a wide range of sizes to meet all your requirements.

Why not use the service offered by Diamond Crystal's staff of trained food specialists who will assist you in selecting the proper type salt for your product? For more information, call the nearest Diamond Crystal sales office or write to Diamond Crystal Salt Co., St. Clair, Michigan.

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ST. CLAIR, MICHIGAN

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Chicago • Detroit • Louisville
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St. Clair, Michigan

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Impact on Packaging

continued from page 25

a range of structures and a group of minor additives in the form of stabilizers, antioxidants, plasticizers, pigments, etc., whose technical effects are important to produce the desired results.

In many instances these are complex structures, difficult to identify. Yet, in order to prove safety in use, components of the extract must be identified. This will require development of a methodology for identification of a number of chemical entities whose identification today is not clear.

The direction in which these identification procedures must go is that of *advanced instrumental analysis.*

Use of infrared, visible and ultraviolet spectroscopy in examination of packaging material extracts will become common, as will also nuclear magnetic resonance techniques and chromatography. These methods are coming into use in extractability studies.

How much migration is "safe" is the next problem. Is it one part per million? Is it one part in ten million? Is it one part per 100 million? The FDA replies that this depends on the substance, its pharmacological properties and its toxicology.

Thus, if an unknown chemical entity can be identified in an extract from some complex plastic structure by use of, let us say, an infrared absorption spectrum in a concentration of one part in ten million, FDA can argue that since such a compound has not been studied in the past and since data on its toxicology are not available, even so small a quantity might present a hazard, and therefore feeding tests are required.

If the substance in question is suspect as being of a carcinogenic nature, the plastic from which it has been extracted may automatically be ruled unsafe for foods under the Delaney Amendment.

The quantitative question arises in another sense. Let us suppose an organic molecule "X" has demonstrated that, under certain conditions, it may cause cancer in some test animals when fed at certain

dosage levels. Under the Delaney Amendment, *no* "X" may be permitted in a food product.

Let us suppose that a plastic material "A" has wide usage in the food packaging field. Extraction tests indicate that no compound "X" is found, utilizing methods available today.

Some years hence, analytical procedures develop, let us say, to a sensitivity of one part in several billion. Using these newer procedures, compound "X", a potential carcinogen, is found in the extract from plastic "A". Under the Law, plastic "A" may no longer be used in food packaging.

Thus, judgments of safety for certain materials, under the Law, may become a function of the state of the science of analytical chemistry rather than real considerations of what may or may not be safe. The Delaney amendment raises the whole question of "how small is nothing."

Having completed extraction tests and found extracted substances concerning which no data or limited data are available, proof of safety now becomes a matter of feeding tests.

Acute toxicity tests must be performed to determine lethal dosages; then, sub-acute tests are necessary to determine safe levels, and, finally, chronic toxicity tests to determine long-term effects.

To prove the non-carcinogenic nature of a substance, at least two generations of animals must be tested, in addition to feeding tests on animals whose metabolism approaches that of humans. Conducting such feeding tests requires considerable skill and judgment in evaluating results.

The substance to be tested must be representative of commercial practice, with the impurities one might expect to find in a commercial product.

Control animals must be fed along with the test animals. As the animals die or are sacrificed, histological specimens of all the vital organs must be made and examined.

Studies must be made to determine if the test chemical

GET RESULTS WITH KRAFEN

(Kraft's spray-dried sweet whey)

If you use a dairy ingredient in manufacturing baked goods, frozen foods, dry mixes, sauces, processed foods, confections or ice cream, replace it with Krafen and . . .

Bring Out Flavor normally masked by high protein levels in other dairy ingredients. The milk sugars in Krafen allow flavor to come through stronger. This means that frozen food manufacturers, for example, save substantially on the use of expensive seasonings.

Extend Shelf Life of your baked goods by a profitable margin due to Krafen's unusually high moisture-retaining properties.

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Save up to 5¢ a Pound on dairy solid costs by using Krafen—and still be assured that you're using a superior replacement for your present ingredient. For Krafen is a high-quality, low-bacteria dairy ingredient produced by Kraft under conditions of maximum sanitation in one of the world's largest whey plants. Why not experiment with Krafen in your *new* products as well as *present* products. Send for your free test sample today.

MAIL THIS COUPON FOR FREE SAMPLE OF KRAFEN

KRAFT

KRAFT FOODS INDUSTRIAL DIVISION, Chicago 90, Ill.

Gentlemen: I would like to test KRAFEN in my products. Please:

☐ **Send me a free sample as well as latest data on KRAFEN, your improved spray-dried sweet whey.**

☐ **Have a Kraft Man call on me to discuss uses of KRAFEN in my products.**

I understand there is no obligation connected with my request for a sample and/or technical assistance.

Name_____

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is absorbed into the body or is essentially indigestable. If the test chemical is absorbed, does it tend to concentrate in some particular organ? Any abnormality occurring in any of the test animals must be detected and evaluated.

When all this is completed, the results must be extrapolated to man, and experienced judgment must be exercised in the final evaluation. Even if the test substance is eliminated by the animal, without absorption, a study must be made of its effects on the intestines.

To do this work requires space, equipment, skilled personnel, time and money. A single extraction study may run as high as $1500. Feeding tests on one substance can run from $35,000 up, and can consume two to four years, depending on results.

Introduction of requirements such as these to an industry to which they are new must have economic consequences.

Economic Consequences

The demonstration of safety of the total marketable item — food, package, shipping container, et al. — is the initial responsibility of the last processor handling the product prior to its entry into distribution channels.

The food processor who does a complete job has been made conscious of the responsibility he carries and has passed this responsibility back to his suppliers by use of two devices: (1) the simple customer-supplier relationship, and (2) by requesting and obtaining guarantees in one form or another of conformity of the supplier's product with the new Law.

Whether or not such guarantees are effective in protecting the processor against the injunctive and criminal prosecution power of FDA, they may protect him financially against potential civil liabilities.

Because of the awareness of this on the part of suppliers, many of these guarantees have been of a hedging nature. The

Economy never came in such a choice!

NEW FORD TRUCKS FOR '61

619 new models! All engineered with one idea in mind . . . economy! New "Big Six" engine for 2-tonners plus five Cummins diesels for the new H-Series tractors expand the proven line of Ford engines to 18—with one just right for your job. Stronger frames, improved cabs and sheet metal, more reliable electrical systems and softer-acting springs are typical of the advances that mean greater day-to-day savings.

And . . . on all 1961 Ford Trucks, each part, except tires and tubes, is now warranted by your dealer against defects in material and workmanship for 12 months or 12,000 miles, whichever occurs first. The warranty does not apply, of course, to normal maintenance service or to the replacement in normal maintenance of parts such as filters, spark plugs and ignition points. See your Ford Dealer.

New! Heavies and Extra Heavies

Ford's Heavies and Extra Heavies are built for unprecedented durability! New 100,000-mile warranty on Super Duty V-8 gas engines is most liberal in the industry. On 401-, 477- and 534-cu. in. V-8's, Ford Dealers will replace any major engine part (including block, heads, crankshaft, bearings, valves, pistons, rings) found to be defective in materials and workmanship in normal on-highway use. Warranty covers full cost of replacement parts for 100,000 miles or 24 months, whichever occurs first . . . full labor costs for first year or 50,000 miles, sliding percentage scale thereafter.

NOW! CHOOSE FROM 7 NEW SERIES . . .
GVW'S UP TO 51,000 LB.—
GCW'S UP TO 76,800 LB.

FALCON ECONOLINE PARCEL F-SERIES

New! "Big Six" Engine

More power for America's savingest 2-tonners with a big 262-cu. in. Six, designed to give you the power of big displacement, the durability of heavy-duty construction, plus the gas economy of 6-cylinder design! Available early 1961. You also get improved riding comfort with new smoother-acting springs and a rugged front suspension that can give up to twice the tire life of other makes.

New! Space-Saving Tilts

Ford's popular Tilt Cab Series outsells all other makes and for good reason! Compact 82-inch BBC permits longer bodies for a given over-all length, and wide-track front axle makes it more maneuverable for congested area work. Simplified tilting mechanism exposes entire engine for money-saving ease of servicing. Ford offers the lowest-priced* tilt-cab model in the industry!

*Based on a comparison of latest available manufacturers' suggested retail delivered prices

C-SERIES

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FORD TRUCKS COST LESS

YOUR FORD DEALER'S "CERTIFIED ECONOMY BOOK" PROVES IT FOR SURE!

FORD DIVISION, Ford Motor Company

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supplier to the food industry, in turn, has thrown the responsibility back to *his* supplier with the same request for guarantees.

Since the food processor and package materials supplier rely on the chemical industry for the raw materials with which this Act is concerned, the ultimate responsibility for proof of safety has been thrown back to this industry.

In addition, the capability to do the technical part of the job does not exist within the packaging materials industry, nor does the profit margin within the industry allow for expenditures of this order of magnitude for work of this kind.

Burden of obtaining proof of safety for a package thus has passed from the food processor through the package supplier back to the chemical industry, since this industry, or a part of it, has the capability to obtain the evidence and the necessity to do the work to protect an important part of the market for its products.

With many products that have been in use for some time, all this work will not be necessary. Acceptance of many packaging materials because of a good history will occur. But all new materials will be subjected to the detailed proof-of-safety requirements.

Proof of safety will become an important part of development work. Since the chemical industry will have most to say about such proof, it will also have most to say about what chemicals it will or will not study.

Statements have been made by some chemical companies that, because of limited markets, expenditures for proving safety of some chemicals cannot be justified. If a user wishes to develop food packaging applications for these substances, the burden of proving safety then rests with him. He then must consider carefully whether the reward justifies the effort, since, in many cases, a new development in the packaging field cannot wait two years for the completion of chronic toxicity tests. END

Flexibility of the compounds is illustrated by the sheet of acetylated monoglyceride (acetostearin) folded over a spatula on the right, as contrasted with the "brittle" lumps of triglycerides (tristearin) at left

Photo courtesy of Southern Utilization Research and Development Division, USDA

FDA approval of distilled acetylated monoglycerides gives food processors • • •

New Packaging Technique: Edible Protective Coating

Also edible plasticizer for plastic films

New Ingredient: Edible Emulsifier

New Processing Aid: Edible Lubricant

A

Many years of intensive research lie behind the demonstration that Distilled Acetylated Monoglycerides are wholesome and nutritious.

After nearly nine years of testing, distilled acetylated monoglycerides have been given a safety clearance for use in or on foods.

Preliminary tests, when distilled acetylated monoglycerides were first recognized as having possible use in or on foods, indicated that high levels of the compounds in the diet (30 to 50%) were well tolerated.

Digestion studies showed that the distilled acetylated monoglycerides are handled by the body in a way similar to that of the natural fats from which they are made.

Toxicological studies, including acute and chronic tests conducted by Dr. D. C. Herting of the Biochemical Laboratories at Distillation Products Industries, demonstrated no adverse effects.

The conclusion that there was no toxicity was further confirmed by studies on similar products conducted by Dr. R. S. Harris of the Massachusetts Institute of Technology.

Long-term feeding experiments were also made by the Western Utilization Research and Development Division of the USDA at Albany, California. These tests used a different basic diet. Following this approach the scientists at WURDD and at DPI found that the fat deposits of rats could be changed if hard fats were fed for a long time in the absence of soft fats. This effect was used to demonstrate again that the distilled acetylated monoglycerides were handled by the body in the same way as the parent fats.

The biological studies were extended far beyond those designed for ordinary food additives, because the distilled acetylated monoglycerides were expected from the beginning to have wide usage. Some of the first rat tests went for 700 days; confirmation and extension of these experiments occupied many years.

By this intensive testing Distillation Products Industries has proved that distilled acetylated monoglycerides are as safe to use in or on foods as any other type of fat.

Their petition for FDA approval, however, requested a use level of only 5%, deemed a practical limit for presently envisioned commercial uses.

DR. GEORGE Y. BROKAW
Product Development Department
Distillation Products Industries

IN THESE DAYS of strict control over safety, under the Food Additives Law, it is rare indeed when the food industry is presented with a new edible material which has so many possible applications as do distilled acetylated monoglycerides.

These compounds have been approved by FDA as safe for use in or on foods at levels of 5% as set out in the regulations*. This 5% level is not, however, any indication of limited safety (see box A).

Most intriguing of the possible uses for distilled acetylated monoglycerides is their application as an edible protective food coating. Applied by spray or dip methods, a perfect skin-tight film is formed which does not bridge across any indentations and crevices in the product.

Both the Meat Inspection Division and the Poultry Inspection Division of the USDA have been fully informed so that they may consider individual uses of distilled acetylated monoglycerides which fall within their jurisdiction.

It is interesting to note that the properties of the edible acetylated monoglycerides are such that they can replace micro-crystalline wax in some uses such as a coating for paper or paperboard. On the other hand, the liquid forms of edible acetylated monoglycerides can replace mineral oil or other inedible lubricants for use on equipment or packaging films which come in contact with foods.

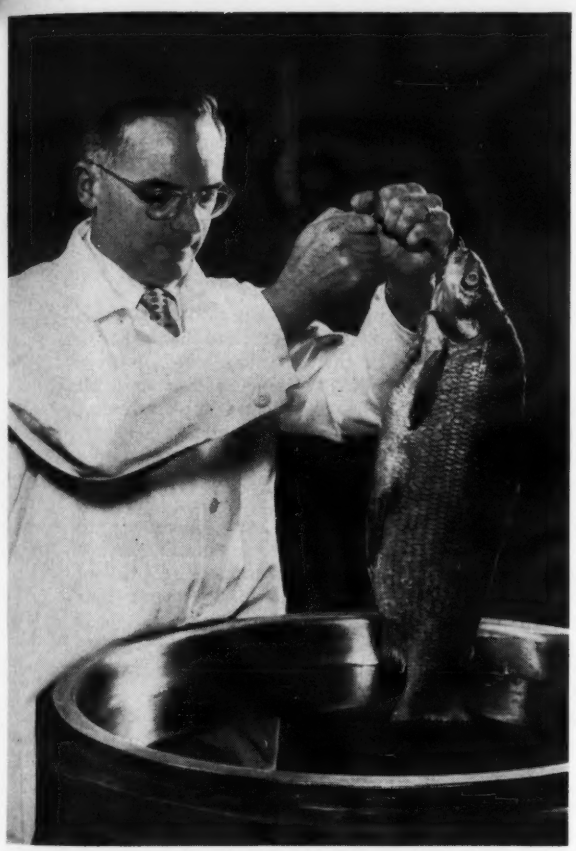
They also have many possible applications as an edible plasticizer in the compounding of plastic films for food packaging use.

This new material is available in three types, (see box B), with a wide range of melting points. While each type has specific uses, blends of the types give intermediate properties.

Distilled acetylated monoglycerides have an oxidative stability many times that of their parent fat when tested under same conditions. Even greater stability is achieved by incorporating small portions of an edible anti-oxidant

*U.S. Food & Drug Regs., 21CFR 121.1018

Coating frozen fish is one of many possible applications for distilled acetylated monoglycerides, which could upgrade consumer quality of fish. In this demonstration, Gerald D. Neu of Distillation Products Industries is coating a whole frozen fish. Such a coating may be used as a replacement for the laborious icing and re-icing currently used in storage of whole frozen fish



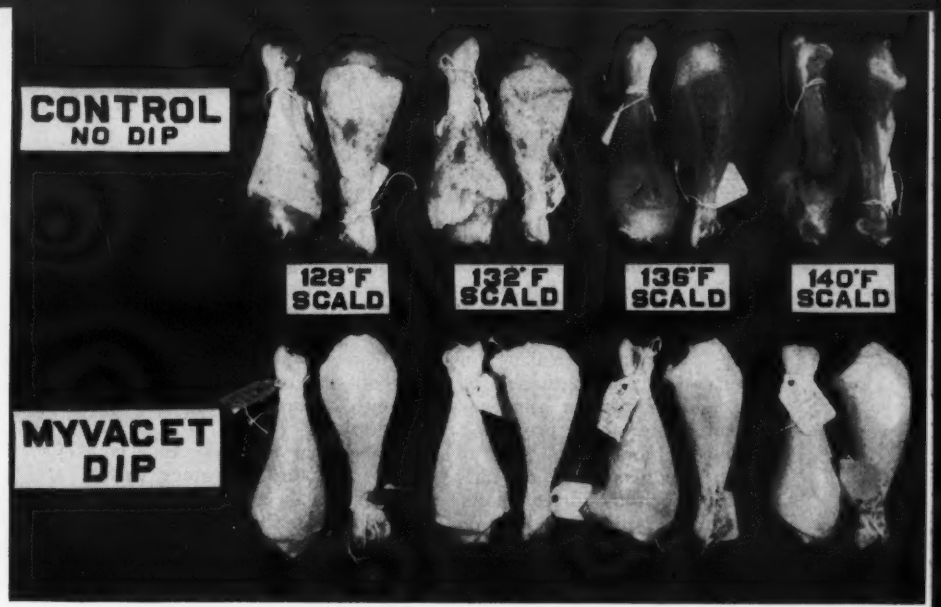


Photo courtesy of Delaware Agricultural Experiment Station, University of Delaware

Chicken legs, coated with distilled acetylated monoglycerides following various scald treatments, retain their natural color much longer and do not lose nearly as much weight from dehydration as do the uncoated products. In studies made by C. W. Woodmansee and O. J. Abbott at the Delaware Agricultural Experiment Station, broiler legs were subscalded at 140 F to aid in easier removal of feathers. Legs were then coated with distilled acetylated monoglycerides and stored at 40 F and 85-95% RH. Uncoated legs were used as controls. Examination at the end of ten days indicated that the coated chicken legs had retained their natural color. In addition, weight loss of the coated broilers was only 6.3% after ten days storage, while uncoated legs lost 30.2% weight in the same period

combination into each type to provide extremely good protection against rancidity.

Edible protective coatings

The solid Type 7-00 distilled acetylated monoglyceride forms flexible films at room temperatures that retain their flexibility at low temperatures.

These solid products have numerous possible applications as protective food coating. Requirements for a successful coating demand that the product to be coated must provide a firm backing for the coating.

Thus, successful coatings are possible on such foods as processed or frozen meats, frozen poultry, frozen fish, dried fruits, nuts and confections and cheese.

In products which are to be cooked, the edible coatings can remain on during kitchen preparation and form part of the fat, gravy and run-off juices.

Because the MYVACET colorless liquid with good lubricity, making it useful also as a release agent for foods and as a lubricant for food equipment.

B Three types of distilled acetylated monoglycerides

Supplied under the registered trade-mark "MYVACET", distilled acetylated monoglycerides are available in three types.

Type 5-00 is a creamy, white, waxy solid with a melting point of approximately 106 to 109 F. It is especially suitable as a protective food coating material on non-refrigerated foods, and as an emulsifier-plasticizer.

MYVACET Type 7-00 is a soft, non-fracturing, flexible, creamy-white, waxy solid with a melting point of about 99 to 104 F. It is particularly useful as a protective coating for refrigerated foods.

MYVACET Type 9-40 is a low-melting oil with a congeal point near 45 F, which is applicable as a plasticizer for Type 5-00 and 7-00, as well as other fats, oils and certain plastics. It is a clear, almost

The following technical bulletins, available from Distillation Products Industries, Rochester 3, New York, discuss specific applications for distilled acetylated monoglycerides:

- A-1 General Information
- A-2 Coating Fresh and Frozen Poultry
- A-3 Coating Processed and Frozen Meats
- A-4 Coating Frozen Fish
- A-5 Coating or Surface Lubricant on Dried Fruits
- A-6 Coating Nuts and Confections
- A-7 Shell Egg Oiling

7089 on Reader Service Slip.

coatings do not have great tensile strength, they cannot be stripped off. However, if desired, they can readily be removed by simply holding the products under the hot water tap for a few seconds.

Also, they can be applied over a strippable casing or overwrap or strengthened by the addition of an approved plastic material to provide a strippable coating.

On products such as nuts and confections, dried fruits, etc., the coatings are left on and consumed as part of the food.

Water vapor permeability of the film is less than that for cellulose acetate, and only slightly greater than for nylon, ethylcellulose and polystyrene.

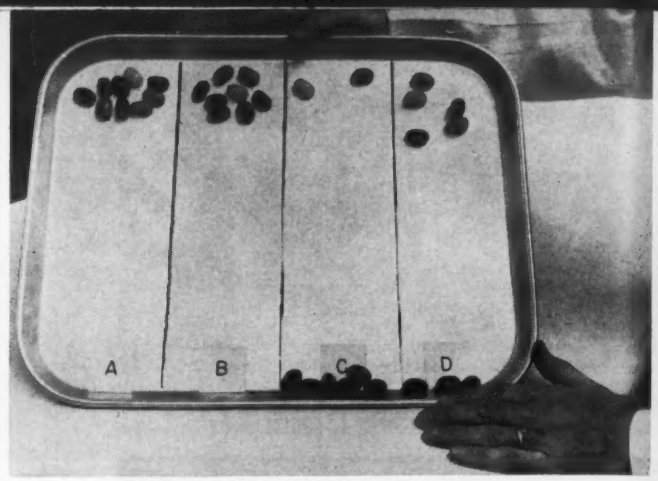
Permeability of these films to carbon dioxide is less than that for ethylcellulose and approximately the same as for polystyrene and polyethylene. And these films are less permeable to oxygen and nitrogen than are polystyrene and ethylcellulose.

Thickness of the coatings is controlled by the type of distilled acetylated monoglyceride used, its temperature when product is dipped or sprayed with it, temperature of the product being coated and the length of time of the coating operation.

A typical example may be shown in the laboratory with frozen veal chops. A good coating can be achieved by dipping the chops into a bath of distilled acetylated monoglycerides at a temperature of 266 F for five seconds.

This will provide a coating less than 10 mils thick, amounting to about 3.5% of the weight of the chop. Coating for a chop weighing four ounces would cost about 1/2 cent.

Applications for the use of distilled acetylated monoglycerides as protective edible coatings are considered now in some detail for various possible uses.



As a lubricant, distilled acetylated monoglycerides have numerous possibilities. Non-sticking characteristics of various products used as slab oils are demonstrated in above photo. Jelly beans were placed on a uniformly heated pan that had been precoated with test oils. Pan was cooled and then tipped. Area (A) had no coating, area (B) was coated with vegetable oil, area (C) was coated with MYVACET Type 9-40 and area (D) was coated with mineral oil

Distilled acetylated monoglycerides, used as protective coatings on **fish and poultry**, offer several distinct advantages in possibly upgrading consumer products. These applications are considered in some detail in the accompanying photos.

Frozen meats, to be successful in my opinion, not only must be of *superior quality*, but must be packaged and stored so that they are kept in a condition of *superior quality*. To the extent that packaging techniques heretofore used for frozen meats have not met such conditions, coating with distilled acetylated monoglycerides is clearly indicated.

In any event, this new packaging technique for frozen meat offers interesting possibilities.

In use on **dried fruits**, edible protective coatings will minimize sticking and clumping during storage (see photo of coated raisins) as well as discoloration, attack by microorganisms and further dehydration.

Coatings are especially useful for this type fruit incorporated into dry cereals or other dry products.

Generally, the dried fruit is dipped or sprayed with the melted MYVACET. Fruit may be treated previously with a dusting powder to make it sufficiently dry to allow free tumbling to assure exposure of all surfaces during application of the coating material.

Nuts and confections coated with the edible coatings will have a finish which is dry to the touch and harmless to over-wraps or containers.

The coating will prevent nuts from rapidly losing their crispness and flavor and protect against rancidity by attacks of moisture and oxygen from the air.

Furthermore, nuts coated with this protective film tend to retain crispness in moist confections and ice cream.

Hard candies treated with the protective film, resist becoming sticky and unattractive from high humidity. On the other hand, confections, meant to be soft and plastic, can be coated with the film to retain their chewability when exposed to low humidity.

Nuts and confections may be coated either by dipping into or by spraying with liquified distilled acetylated monoglycerides, while they are tumbled.

After film formation, the products are then handled according to usual plant routine.

Specialty **cheese** items may be protected against external

continued on page 43

C An accidental discovery

Unique properties of acetoglycerides useful in the food field were discovered by accident at the Southern Regional Research Laboratory of the United States Department of Agriculture. The discoveries came during a program searching for uses for modified fats prepared from U.S. farm products. A search of the literature made at the time uncovered very few references which mentioned the preparation of acetoglycerides and none of them described these unique properties.

To encourage wider use of the farm-produced fats and oils used in making acetoglycerides, R. O. Feuge and his associates, E. J. Vicknair, N. V. Lovegren, and others at the United States Department of Agriculture Laboratories, published their findings in about 28 articles and patents concerned with physical chemical and nutritional investigations of these materials.

Utilizing this background information published by the Southern Regional Laboratory, Distillation Products Industries of Rochester, New York further developed the manufacture utilizing their high vacuum "molecular" stills to produce commercial Distilled Acetylated Monoglycerides of uniformly high quality and with a range of physical properties suiting them to a variety of uses in the food field.

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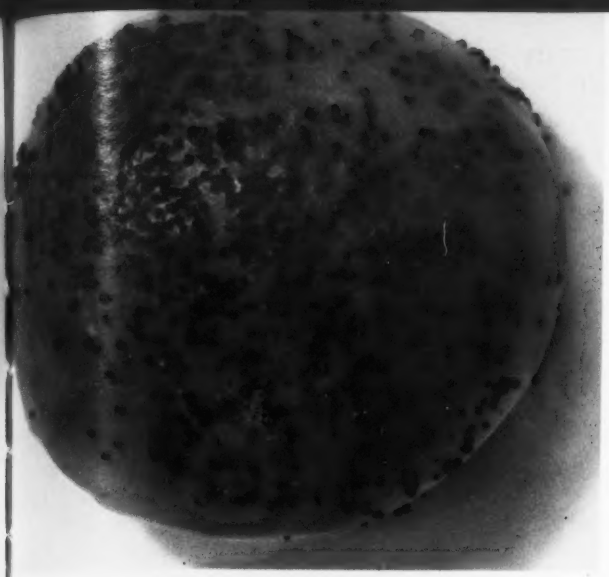
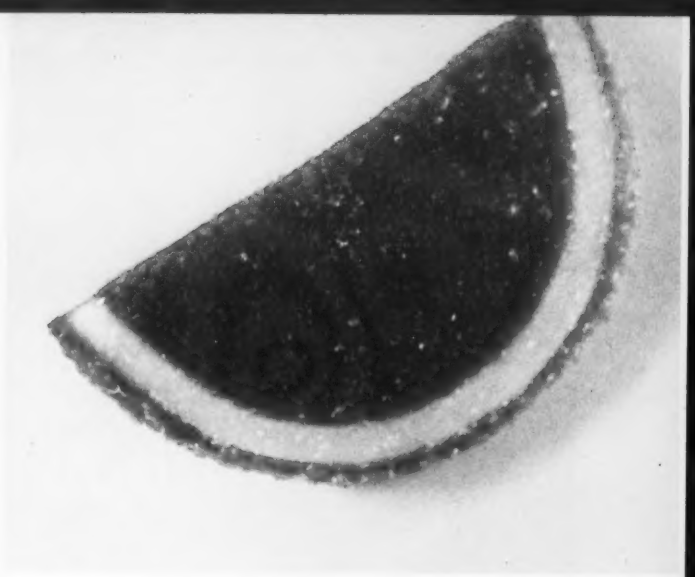
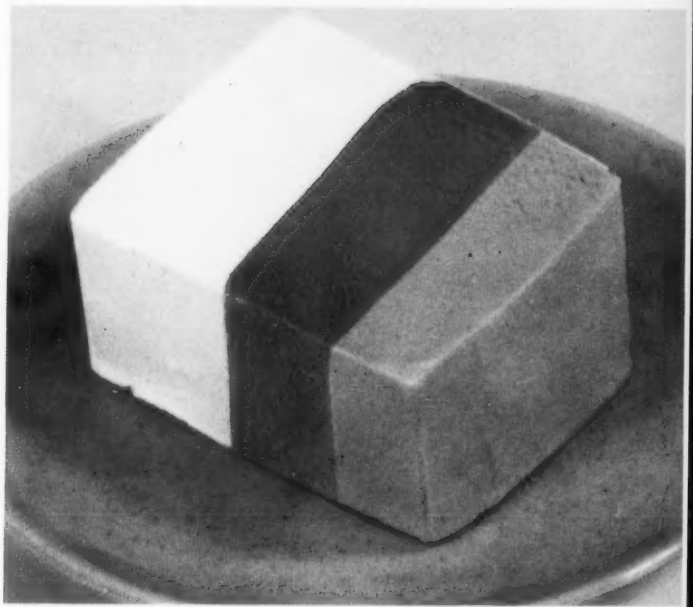
For more information on product at right, circle 7090 opposite last page







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Distilled acetylated monoglycerides continued

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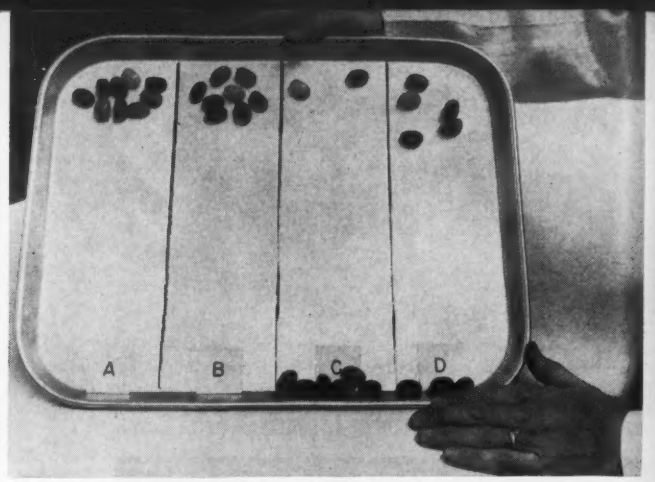

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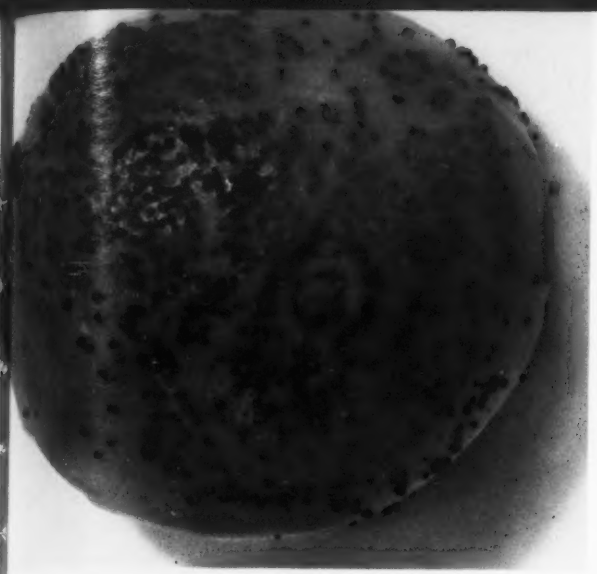
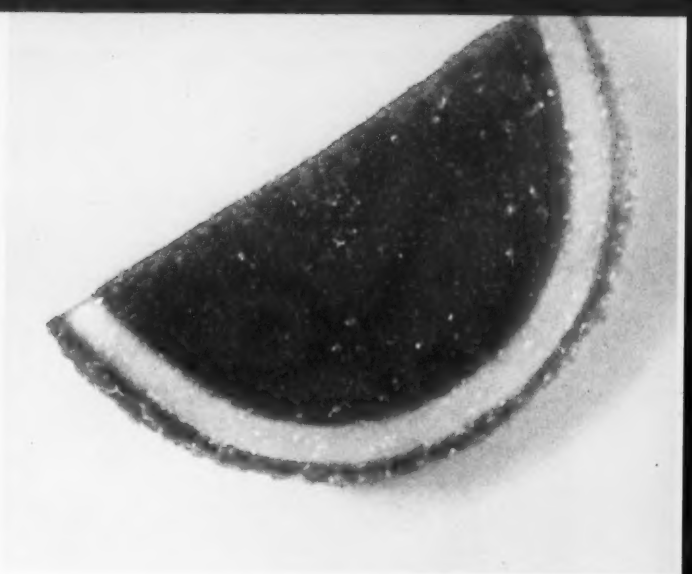
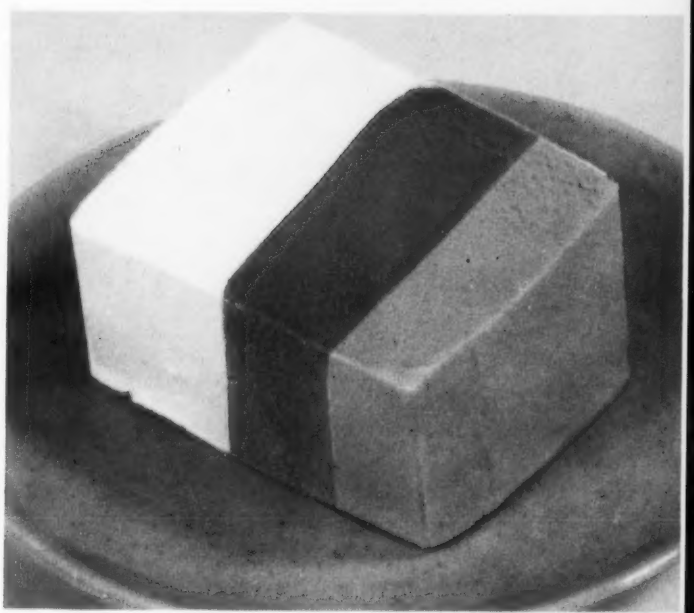
For more information on product at right, circle 7090 opposite last page







avorful, quality, eye-appealing foods...

naturally superior...when made with...

sugars, starches and syrups from

INDUSTRIAL DIVISION

CORN PRODUCTS

COMPANY

WRITE OR PHONE *Corn Products for expert technical assistance... helpful data on these fine products for the Food Industry:*

CERELOSE® dextrose sugar • REX® and GLOBE® corn syrups • BUFFALO® • HUDSON RIVER® and SNOWFLAKE® starches.

CORN PRODUCTS COMPANY INDUSTRIAL DIVISION • 10 East 56 Street, New York 22, N. Y.

HERCULES

"BEEF-UP" YOUR REPEAT SALES WITH HVP-CENTURY

The initial sale is important but volume is built on repeats. That's why so many food processors are including Hercules HVP®-Century powdered in their formulations for the flavor of well-browned beef. It's a flavor that brings satisfied customers back to the counter again for "seconds."

HVP-Century, a total hydrolyzed vegetable protein derived from wheat protein, contains 100% of all the amino acids derived from the hydrolysis with none of the monosodium glutamate removed.

The latest addition to Hercules' full life of HVP powder and liquids and MSG, HVP-Century offers many possibilities for cost savings and processing advantages.

A four-page data sheet is available to provide complete specifications on HVP-Century as well as information on how to compute cost savings and convert formulations. A data sheet and a sample of HVP-Century, which has FDA acceptance for use in many applications, can be obtained by writing:

Huron Milling Division, Virginia Cellulose Department

HERCULES POWDER COMPANY

INCORPORATED

Hercules Tower, 910 Market Street, Wilmington 99, Delaware

VH60-7

7091 on Reader Service Slip.

microorganisms, rancidity and dehydration with these edible coatings. The liquid form of distilled acetylated monoglycerides also may be used as a rind softener.

Some of the foods discussed in this article are subject to Federal Definitions and Standards of Identity and it is anticipated that these will be amended as required.

Coating the freshly cut ends of **banana** hands with distilled acetylated monoglycerides minimizes spoilage, dehydration and discoloration of the exposed banana end. This could permit the removal of stalks at banana plantations, resulting in lower handling and freight costs.

Raisins coated with distilled acetylated monoglycerides, on the left, do not stick or clump together as do the uncoated, dried raisins on the right

Shell eggs are another product on which distilled acetylated monoglycerides may find a use. Because of its favorable characteristics, Type 9-40 MYVACET is being tested now for use in shell egg oiling.

Distilled acetylated monoglycerides Type 9-40 can be applied to eggs from a dip, or by spray equipment.

Edible emulsifiers

Distilled acetylated monoglycerides offer excellent emulsifier-plasticizer properties. They impart useful characteristics to other fats used in confection formulas. Candies subjected to wide changes in temperatures, will better retain their consistency from high to low temperatures if part of the fat content is distilled acetylated monoglycerides.

continued on page 46

MELT POINT *Kaola-Style*

How Durkee Research Took the Oily After-taste Out of Frozen Desserts

THE PROBLEM: *complex.* Consumers didn't like a lot of things about frozen desserts. Especially oily after-taste and waxy film left in the mouth. The cause was the high melting point of vegetable fats which were being used to provide stand-up characteristics. Frozen dessert manufacturers needed a fat base designed specifically for their use—and Durkee's Technical Research Staff set out to give them one.

THE SOLUTION: *painstaking.* New fat bases were developed. Frozen desserts were made... tested... tasted... and even produced in Durkee's pilot plant which simulates actual plant conditions. The result was Kaola, a patented all-vegetable fat base with a melting point below body temperature. Today, taste panels invariably prefer frozen desserts made with Kaola over those made with competitive products.

THE SIGNIFICANCE: *rational.* Kaola, the unique frozen dessert fat, is another example of Durkee know-how and research facilities helping food producers market better products more economically. We'd welcome an opportunity to provide comparable assistance to you whenever your product or process warrants further attention. Just drop a line to

DURKEE TECHNICAL SERVICE

Department FP • 900 Union Commerce Building • Cleveland 14, Ohio
Jamaica, N. Y. • Louisville, Ky. • Berkeley, Calif. • Chicago, Ill.

QUALITY Glidden PRODUCTS

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Create More Demand for More Products by

Consumer interest in better nutrition has never been higher than it is today. As a result, products backed by strong nutritional claims are steadily gaining an increased share of every food dollar. You can take advantage of this nutritional boom and gain an edge over competition by fortifying with Merck vitamins and amino acids.

Merck offers nearly a dozen different nutrients, all easily adaptable to normal food processing operations. Consider Merck Ascorbic Acid, for example. It can give you promotable vitamin C claims for any number of products—from gelatin desserts and instant potatoes to fruit juice blends and instant drinks. Merck lysine can improve protein quality of cereals, specialty breads and other processed foods containing vegetable proteins. Vitamins B_{12} and B_6—both pioneered by Merck—are musts for all ages, are loaded with consumer appeal, give you unlimited opportunity for offering shoppers extra nutritional value in your products.

If you have new products in the works, or are looking for ways to stimulate sales of existing products—look first to Merck for the nutritional appeal, nutrients, and technical assistance you need.

For the full story call in your Merck representative now, or write directly to Rahway.

More Shoppers with MERCK NUTRIENTS

New booklet shows how you benefit from Merck's food processing laboratory. Send now for your free copy of "Merck Research for the Food Industry."

MERCK CHEMICAL DIVISION

MERCK & CO., INC. • RAHWAY, NEW JERSEY

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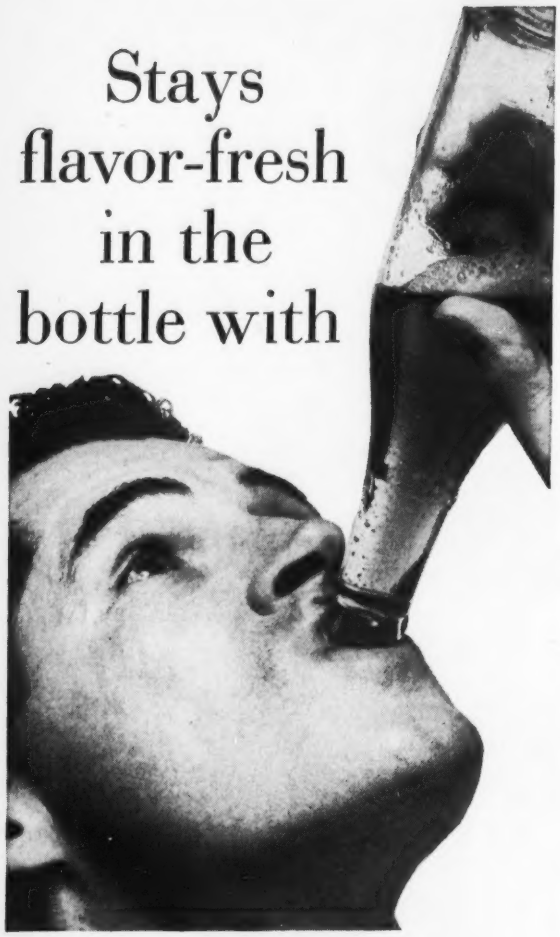
Stays flavor-fresh in the bottle with



GIVAUDAN
SOFT DRINK
FLAVORS

Givaudan-flavored soft drinks have a reputation for flavor retention and long shelf-life. When the cap comes off, the fresh, savory taste, the original strength and color are there to be enjoyed. That's because Givaudan flavors are scientifically formulated and quality-controlled to assure maximum stability and uniformity for prolonged periods after bottling.

Try Givaudan True Fruit Bases and Flavor Concentrates in your formulations. Generous test samples on request.

Givaudan Flavors Inc.

321 West 44th Street, New York 36, N.Y.

7094 on Reader Service Slip.

continued from page 43

Chocolate flavored compound coatings, with distilled acetylated monoglycerides as part of the fat, withstand summer temperatures without melting and remain pliable during winter temperatures.

These same qualities increase the plastic range of fat-based margarine and related table spreads.

The emulsifying characteristics make these compounds useful as components of shortenings designed for the preparation of cakes, cake mixes and icings.

Edible lubricants

The excellent lubricity of edible distilled acetylated monoglycerides Type 9-40 indicates its usefulness as an anti-sticking agent for lubricating cutting edges, slabs, molds and other machinery parts as well as in working of metal, plastic and paper products which may come in contact with foods. One of the uses already finding commercial interest is as a slab oil for candy Photo on page 43 shows test which demonstrates the superiority of distilled acetylated monoglycerides Type 9-40 to other lubricants.

This liquid distilled acetylated monoglycerides can also serve as a divider oil and as a pan grease in the baking industry. Tests already have shown good results in these uses.

In these applications, it has the additional advantage of being quite stable toward oxidation and resistant to subsequent development of gums and off-flavors. END

Algin partially replaces starch in pie fillings

An algin product, Kelcosol, may be used to partially replace starch in pie fillings. Depending upon whether the fillings are canned, in pails, cooked or frozen, and on the type of starch used, one part of the algin product may be used to replace four to seven parts of starch with all types

they're switching

to Lake States Torula Yeast U.S.P. for an Economical Nutrition boost!

Nutritional Supplements . . . as a component of vitamin-mineral mixtures

Canned Food Mixes . . . protein and lysine source for baby food

Seasoning Blends . . . high protein carrier, bland flavor

Institutional . . . ideal additive to high protein, low sodium or therapeutic diets

Pharmaceuticals . . . compatible, edible, nutritional base

Lysine Supplement . . . in cereals, crackers, cookies, breads, snack items

why? Lake States Torula Yeast is a nutritional concentrate of unusually high quality. It has 50% minimum of protein, containing all of the essential amino acids, and is especially rich in vital lysine. It is also a rich and reliable source of B vitamin factors and essential minerals such as calcium, iron, phosphorus and iodine.

A significant content of completely protected, unsaturated, fatty acids is another Lake States feature. This important nutrient is protected by inclusion stabilization and by a natural anti-oxidant which occurs in sufficient excess to offer protection to other fatty materials in a Torula Yeast containing mix.

Lake States Torula Yeast is bland in flavor and blends well with most products. In many applications it also serves as a flavor enhancer.

Produced from sterile media under vigorous and continuous quality control, Lake States Torula Yeast assures you purity, uniformity, and stability, plus long shelf life. At *low cost*, it provides the enrichment your products need in today's nutrition-minded marketplace.

To obtain complete information and a liberal test sample, write today, stating your application.

Lake States
AMERICA'S PIONEER PRODUCER

Lake States Yeast and Chemical Division of St. Regis Paper Company
RHINELANDER, WISCONSIN
DEPT. FP-12

Sales Office: 420 Lexington Ave., New York 17, N.Y.; or W. Glenn Wunderly Company, 232 North Lake Ave., Pasadena, California; Kempsell Associates, P.O. Box 27, Garland (Dallas), Texas; Dillons Chemical Company, Ltd., Montreal and Toronto, Canada

7095 on Reader Service Slip.

of fruit and cream fillings.

Results, when used with various kinds of fruit fillings, indicate enhanced flavor for the fillings since the algin does not smother their naturally delicate flavor.

Used with blueberry pie fillings, the algin has been particularly successful. In this case, it so enhances the flavor of the fillings that there was no need to use any cinnamon, citric acid or lemon juice. The algin also greatly improved clarity, eliminating the need for any coloring.

Similar results have been reported by pie makers using the algin product in cherry, apple, peach and other fillings, except that cinnamon, citric acid or lemon juice was added.

Samples of the Kelcosol algin product are available from the manufacturer.

Supplier: The Kelco Co., 75 Terminal Ave., Clark, N.J.

7096 on Reader Service Slip.

Batter mix for fresh, frozen food

A breading mix, has improved adhesion properties and will enrobe either frozen or fresh foods. It is a dry mix which is used after mixing with water.

Product has been used successfully with fish sticks, scallops, shrimp, and chicken.

Adheso Batter is a blend of corn starch, corn flour, malto dextrine, carboxymethyl cellulose, carrageenin, calcium propionate, and salt. Available in fifty and one hundred pound bags or drums.

Supplier: Golden Dipt Manufacturing Co., 5100 Oakland Ave., St. Louis, Mo.

7097 on Reader Service Slip.

Additional information quickly!

Use the convenient Reader Service Slip, found opposite the back inside cover, to secure additional information for application to your problem.

Staley's Quality Improvement Pointers

Sweetose Syrup Enhances Natural Flavor... Brightens Appearance in Fruit Juice Drinks!

In jams and jellies . . . Sweetose brings out true fruit flavor. Gives a brighter appearance and sheen.

In canned fruit sauces . . . Sweetose holds appetizing color. Enhances that just-picked flavor with balanced sweetness.

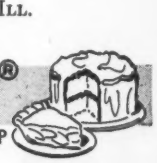
There's no surer, more economical way to improve quality, appearance and flavor in your fruit juice drinks than with Sweetose, Staley's enzyme-converted corn syrup.

Crystal-clear Sweetose assures true *balanced sweetness*. Captures, blends and enhances the various tangy, natural flavors. Holds and brightens true fruit colors.

Investigate the many advantages Sweetose Syrup can bring to your operation. For more information on how you can improve the over-all quality of your fruit juice drinks at *decidedly lower* sweetener costs, see your Staley Representative or write:

A. E. Staley Mfg. Co., Decatur, Ill.

Sweetose®
THE ORIGINAL ENZYME-CONVERTED CORN SYRUP



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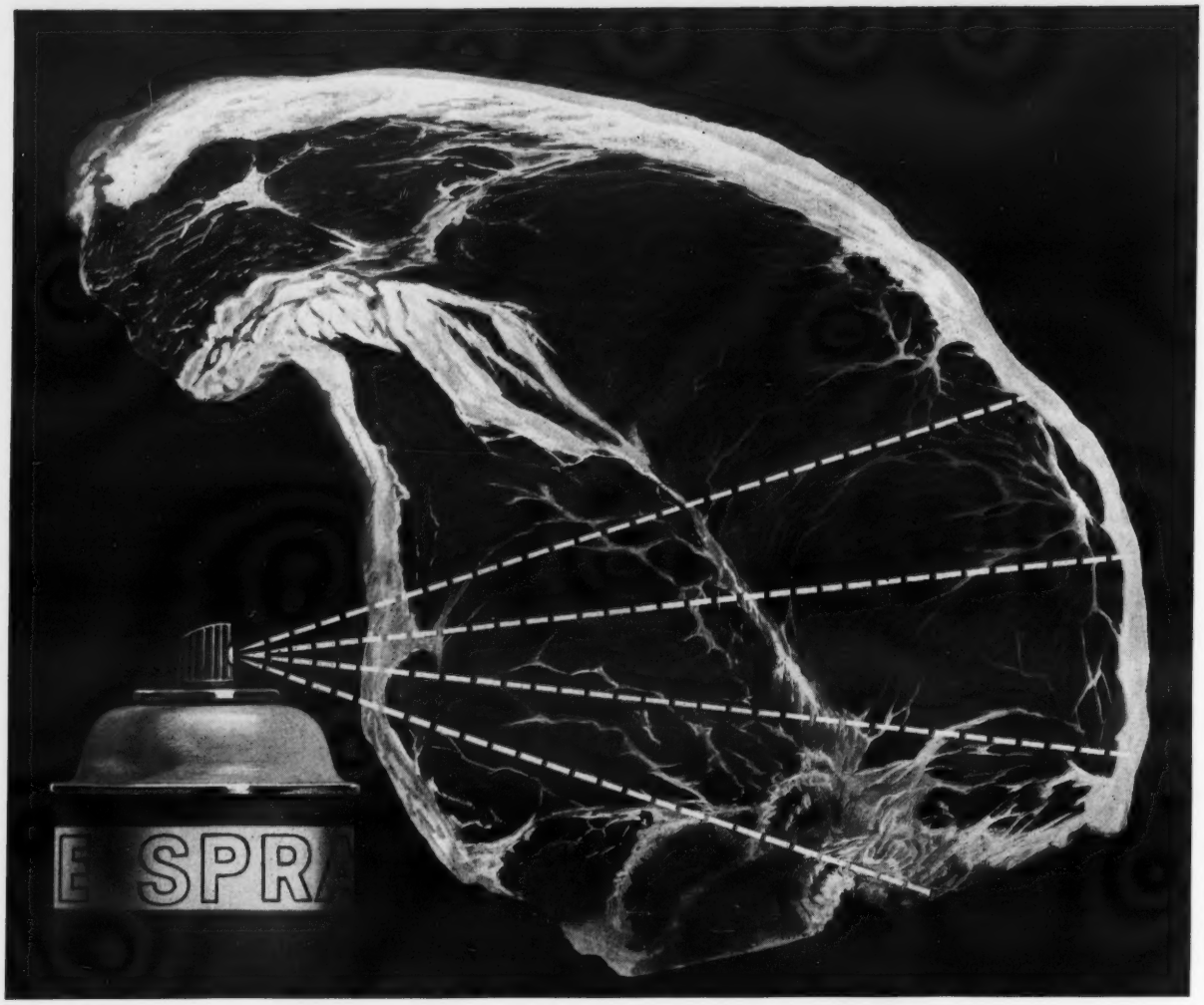

RHOZYME for tailored meat tenderizers

Here's your chance to get off to a good start in the new field of aerosol-packaged meat tenderizers . . . by using RHOZYME proteolytic enzymes, of microbiological origin. Unlike similar products derived from other sources, RHOZYME enzymes can be manufactured to a variety of specifications. They are adaptable to both liquid and powdered meat tenderizers. Basic formulations for both types are now available from our laboratories. The liquid tenderizers are "naturals" for packaging in spray dispensers . . . for convenient, logical, economical application. And since the use of aerosol cans in food marketing is a novelty, tenderizers sold in such containers should enjoy an excellent sales position on retail shelves.

The action of RHOZYME enzymes is also valuable in processing many other protein-containing materials. Examples include: modifying whey protein for cheese spreads; improving the baking characteristics of bread, crackers, cookies, pretzels; producing protein hydrolyzates for diet foods, breakfast cereals, pharmaceuticals; and converting protein wastes (e.g. fish solubles) to animal feeds. Write to Dept. SP-26 for useful suggestions on the use of these enzymes.

RHOZYME *is a trademark, Reg. U.S. Pat. Off. and in principal foreign countries.*

Chemicals for Industry

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

RHOZYME

7099 on Reader Service Slip.

Non-Caking Spray Dried Molasses

Bowen Engineering, Inc., North Branch, N. J., has developed a process for spray drying molasses without the use of any additive, which has produced a relatively stable dry product.

The resulting spray dried molasses powder, produced under the new process, has been kept for a period of over three years without the usual caking. Previously, efforts to produce such a product have not been successful because of the hygroscopicity of powdered molasses which causes it to cake quite rapidly.

The spray dried molasses powder has many applications. Because it does not cake, it may be kept in the bakery for use in a wide variety of bakery foods. It also has possible use in milk drinks, on cereals in place of sugar, etc.

Molasses for cattle feed can also be spray dried for use in the wintertime when liquid molasses is so difficult to handle.

Samples of the spray dried molasses are available to those interested in producing the product.

Antifoamer effective at very low concentrations

Antifoam C, a silicone defoamer for use in processing foods, is effective in very low concentrations. Only 5 to 30 parts per million of the product are required to defoam most foaming systems.

Antifoamer is a water-dilutable emulsion formulated principally for food applications. It may be used in processing such foods as pickles, meat sauces, soft drinks, syrups, whey, vinegar, starch, yeast, vegetables, wines, etc.

Its use in nonstandardized foods is permissible in amounts up to 33.3 parts per million under the Food Drug and Cosmetic Act as amended by

the Food Additives Amendment of 1958.

Defoamer has very good emulsion stability. Even high dilutions need only an occasional stirring to remain dispersed.

Supplier: Dow Corning Corporation, Midland, Mich.

7100 on Reader Service Slip.

"Why Flour is Bromated"

"Why Flour is Bromated" is title of 2-page bulletin No. 162 of the American Society of Bakery Engineers, by Dr. Betty Sullivan, Russell-Miller Milling Co., Minneapolis, Minn.

In spite of the fact that bromate has been used for many years as an improver of flour, there are still numerous questions asked about flour marked "bromated". This paper answers many of these questions.

Dr. Sullivan has written the paper in layman's language in order that the use of bromate as a flour maturing agent may be understood by all who have an interest.

Copy of the bulletin may be had on request to Victor E. Marx, Secretary, American Society of Bakery Engineers, Room 1354, LaSalle-Wacker Bldg., 121 W. Wacker Dr., Chicago 1, Ill. Request must be accompanied by a 4¢ stamped, addressed, long envelope.

Outlines use of algin in numerous food products

"Emulsifying, Thickening, Suspending and Stabilizing with Algin" is subject of a 4-page technical bulletin, F #40, issued by Kelco Company.

The composition and general properties of algin are discussed preliminary to separate sections on thickening, emulsifying, stabilizing and suspending with algin.

Included and featured with the bulletin is a separate, pull-out, two-page table listing ten algin products with general applications and spe-

NOW AVAILABLE . . . A 100% NATURAL FORTIFIER TO IMPROVE AND ACCENTUATE THE FLAVOR OF

MUSHROOM

Food manufacturers have long needed this convenient, highly concentrated flavor to strengthen the character of their mushroom-flavored SOUPS, GRAVIES, MEAT PREPARATIONS, SPAGHETTI and BARBECUE SAUCES, CHEESE DIPS, CONDIMENTS and other food delicacies.

FRITZBRO®

MUSHROOM

CONCENTRATE is made in our own plant from selected grades of imported mushrooms. Its flavor strength is many times that of the domestic variety and its use lends a taste-pleasing bonus to the food product's flavor. It has great stability, is entirely free of all bacteria, molds and fungi, and it mixes easily in aqueous solutions. Our AROMALOK®

MUSHROOM

supplies the same high-quality, concentrated effect in instant-powder form. Generous testing samples – either liquid or spray-dried – will be supplied FREE upon request.

FB INC.

FRITZSCHE BROTHERS, Inc.

A FIRST NAME IN FLAVORS SINCE 1871

76 NINTH AVENUE NEW YORK 11, N. Y.

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7101 on Reader Service Slip.

cific uses for each product. Specific properties for each of the algin products are also shown in the table.

Table indicates that the widely diversified food applications of algin include use in pie fillings, frozen foods, fountain syrups, bakery jellies, beer, dry mixes, soft drinks, icings, fruit syrups, toppings, French dressings, marshmallow preparations, sauces and meringues.

7103 on Reader Service Slip.

New Line of

Flavor Enhancers

Protein hydrolysates modified for specific applications

Consideration of the high cost of beef extract and the industry need for a completely controlled uniform product led The Nestle Company, Inc. to develop replacements.

Eventually their technologists standardized a line of protein hydrolysates from plant sources which proved to be useful as a flavoring material in the manufacture of beef type products and also as a meat flavor enhancer for more general use.

The hydrolysates similar to beef extract with a heavy beef flavor are designated as 4-BE; those that are partially decolorized and for use where a medium strength, meaty background flavor is desired are designated 3H-1. The fully decolorized hydrolysates are designated as 3H-3 which are designed for use in products where mild meat flavors and absence of color are important factors.

All these hydrolysates are available as a liquid, paste, or powder.

A 6-page brochure on these hydrolyzed plant proteins suggests use levels in soups, sauces, gravies, meat products, sea foods, canned and frozen vegetables.

This brochure and samples are available on request to The Nestle Company, Inc., Bulk Division, White Plains, N.Y.

7104 on Reader Service Slip.

INSTANT STARCHES

FOR READY-MIXED SPECIALTIES

TURN OFF THE HEAT!

You name it! Cocktail dips, meat sauces, chiffons, chocolate milk drinks, fruit toppings—any dehydrated mix from soup to dessert can be thickened and stabilized with Instant Starches from National.

These new pre-gelatinized starches eliminate cooking, prolonged stirring, cooling. Housewife or chef, you simply add liquid to ready mixed specialties and stir. Another outstanding convenience in modern day specialty foods.

Instant Starches from National give every effect from glossy, crystal clear toppings to creamy homogeneous sauces. They even act as a freshener for cakes baked from mixes. We'd be glad to make recommendations. Just contact your nearest National office.

National STARCHES

NATIONAL STARCH and CHEMICAL CORPORATION

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And All Principal Cities in the United States, Canada, England and Mexico

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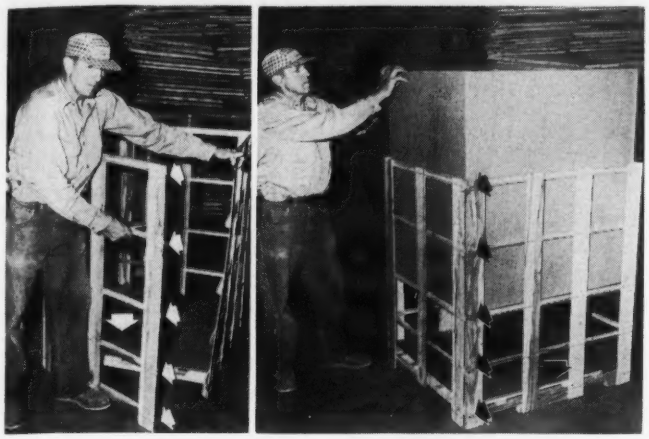
One-piece wirebound blank (note "flats" in background) is folded at left to form four sides of new bulk container for frozen foods. At right, five side loops (small arrows) are fastened and a corrugated sleeve inserted. Note corrugated board covering base (large arrows) and alternate wide bottom cleats that provide fork entry

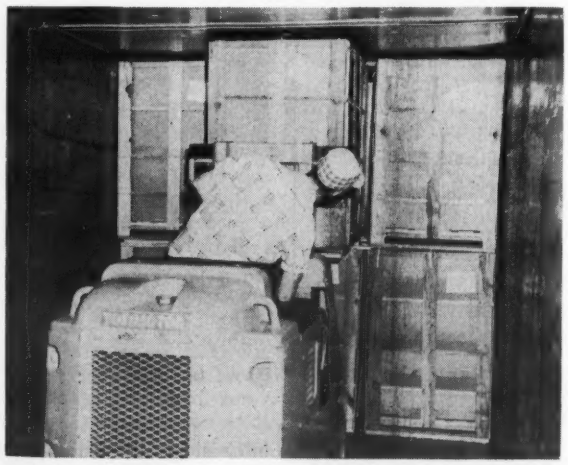


Reusable bulk container with removable liner and four-way-entry pallet base . . .

Cuts Seabrook's bulk handling costs by $50,000 per yr

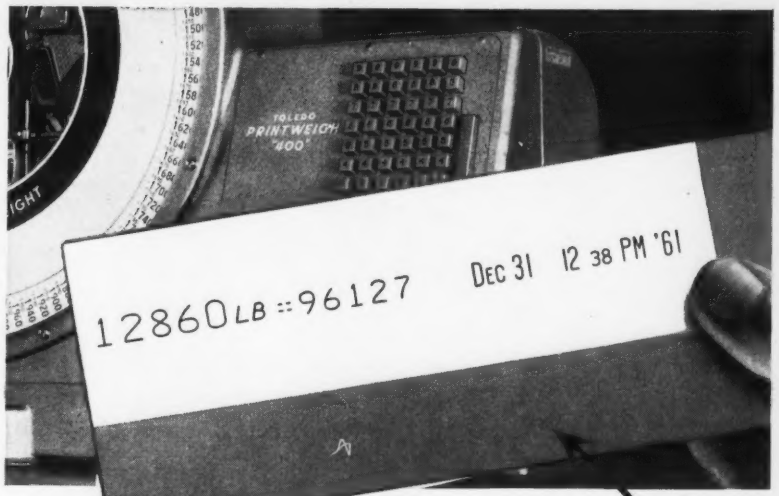
Substantial cost reductions over 50-lb multiwall bags and advantages over other large bulk containers already are showing up in day-to-day use of new 22.6-bu, 1000-lb-capacity bulk containers developed by Seabrook Farms Co. and Package Research Laboratory (Rockaway, N.J.), and manufactured by Indianapolis Wire Bound Box Co., Fernwood, Miss.

Now in use by Seabrook to

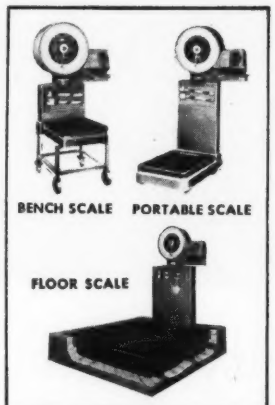


Designed for efficient use of truck-trailer and railcar space, bulk boxes fit three wide and two high, stack up to five high in storage

TOLEDO SCALES that PRINT Complete Weight Records for You . . .



. . . *THE ANSWER* to prevent "guesswork" and errors in cost control!



Toledo Printweigh Scales are available in a full range of models, including Built-in Hopper, Tank, Overhead Track and Motor Truck Scales, in addition to the models illustrated above.

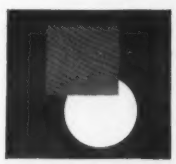
Human errors in reading, remembering and recording weights are eliminated with Toledo Printweigh "400" Scales. They're the surest way to satisfy your requirements for weight records that are complete and indisputable.

Weights are printed in full figures, even when unit weights are used. Choice of printing on 8½" x 11" forms, or on tickets; also on strips. Weight data may be transmitted electrically for recording on remote adding or other office machines. "Memory" feature available for printing weight data, even after load is removed.

Toledo Printweigh "400" Scales give new flexibility and efficiency in weighing . . . to cut costs, guard quality, prevent profit-stealing weighing errors. Ask your Toledo representative for the full story on Printweigh Scales, or WRITE TODAY FOR BULLETIN 2017. TOLEDO SCALE, Division of Toledo Scale Corporation, Toledo 12, Ohio
(Toledo Scale Co. of Canada, Ltd., Windsor, Ont.)

"MISFIT" SCALES MULTIPLY COSTS

Scales can become "misfits" as a result of changes in plant layout, materials handling, inventory controls, value or quantity of materials weighed. If this has happened in your plant, the results can be costly. For example: weighing errors, production bottlenecks, materials handling inefficiencies. Be sure your scales are adequate for the job. Ask your Toledo representative about a scale adequacy check in your plant, or send for the Toledo Weight Fact Kit.



SERVICE Factory-Trained 500 Cities

TOLEDO® *Headquarters for Weighing Systems*

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Maximum clarity, fastest flow rates with Celite Filtration

For products such as fruit juices, jellies, oils, syrups and wines, Celite® diatomite filter aids do the fastest, most thorough job. Because of its unique particle structure and highly irregular particle shapes, Celite filters out the most minute particles at the fastest flow rates obtainable. Product quality goes up and production costs go down.

Celite's low density means greater surface coverage per pound. Processed from the largest and purest diatomite source, it has the highest degree of uniformity in the industry, assuring you of consistent results. Celite offers the widest selection of standard and special grades giving you the exact degree of clarity needed. Today, Celite grades also include Celite perlite. For details on all, see your J-M Filtration Engineer or write Johns-Manville, Box 14, New York 16, N. Y. In Canada: Port Credit, Ontario.

Celite Division filter aids, when used as such, are not considered food additives as defined by FD&C Act Amended, Section 201(s).

JOHNS-MANVILLE

7106 on Reader Service Slip.

Cost Savings Wirebounds vs.

(based on handling 10

First yr, using multiwall bags:	
200,000 50-lb bags	$27,000
7,500 pallets (re-use of 20%)	12,000
Labor to handle, store and use in reprocess, @ .205 per cwt	20,500
1.7% greater shrinkage and handling damage costs @ $.15 per lb	25,500
TOTAL COSTS	$85,000

Second yr, using multiwall bags:	
200,000 new bags	$27,000
750 pallets (1/10th replacement)	1,200
Labor	20,500
Shrinkage and damage	25,500
TOTAL SECOND-YR COST	$74,200

move frozen vegetables between its Western facilities and the processing plant in New Jersey for repackaging purposes, the containers also have good potential for bulk shipments directly to large users.

Success of the containers, is evident from the fact that Seabrook expects to use them for up to 25 per cent of its 10-million-lb annual frozen food output.

Key to the savings (and versatility — reusable, high-stacking, four-way-entry pallet base) is the unique design idea — a mass-produced wirebound wooden "blank" which is set up from the flat right

Breakdown
Bag Handling

million lb of frozen food/yr

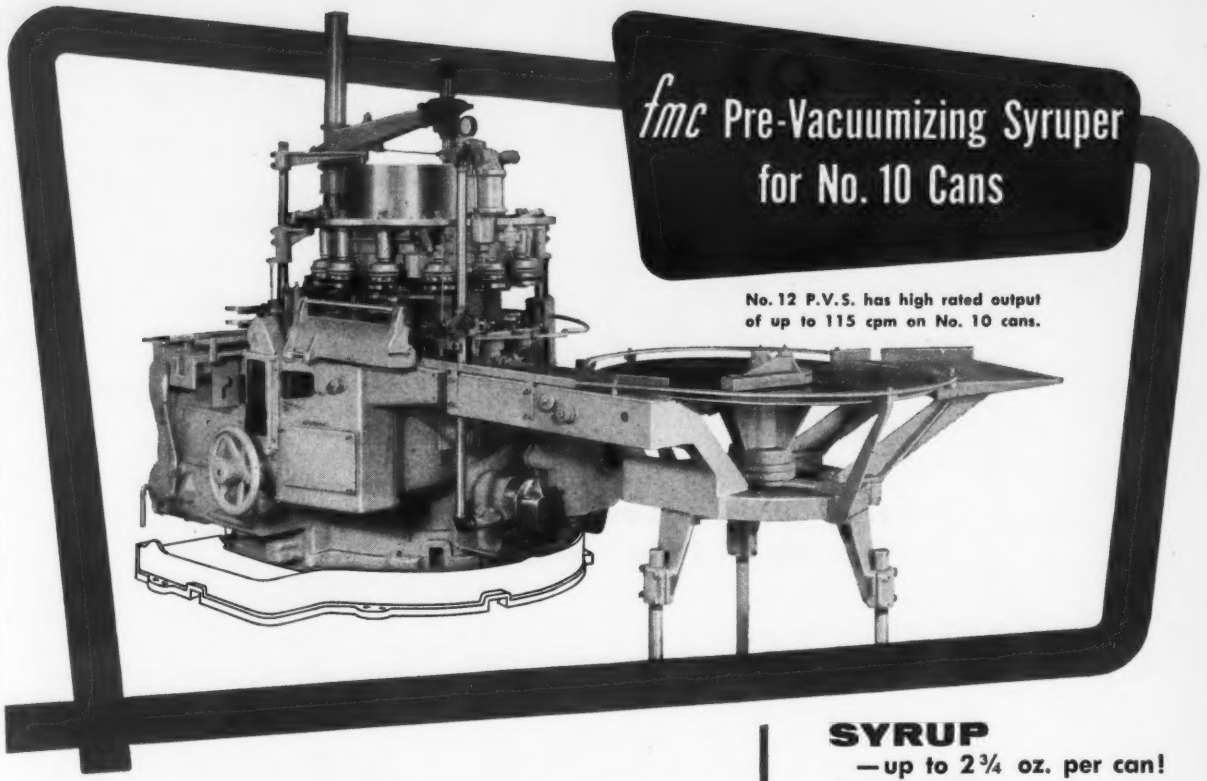
First yr, using wirebounds:	
8000 1000-lb wirebounds, incl. corrugated liners (planning on re-use of 20% each yr)	$41,700
10,000 polyethylene bags	5,000
Labor to handle, store and use in reprocess, @ .093 per cwt	9,300
TOTAL COSTS	$56,000
Resultant gross savings	29,000
Cost of mixing and dumping equipment	10,000
Net savings, first yr	$19,000
Second yr, using wirebounds:	
1,600 wirebounds (1/5th replacement)	$ 8,340
10,000 polyethylene bags	5,000
Labor	9,300
TOTAL SECOND-YR COST	$22,640
Resultant gross savings, second yr and thereafter	$51,560 per yr

in the plant.

The wooden-slatted sides serve most functions of a pallet, allowing use of an inexpensive corrugated-board bottom and low-cost 125-lb-test corrugated lining. Contents are kept free from contamination inside a large polyethylene bag.

The wooden members of the blank are reinforced by five 12-gage steel binding wires. These add to strength of the structure (it deflects only .27 in. under an 8750-lb load) and facilitates fast assembly.

Bottom row of horizontal wooden cleats on the blank supports the slatted wooden base and provides four-way



Save 3 Ways

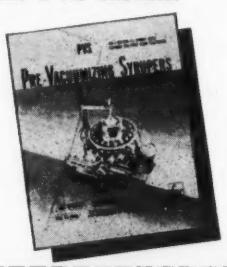
SYRUP
—up to 2¾ oz. per can!
STEAM
—eliminates exhaust boxes!
SPACE
—40 to 80% less!

Now you can speed up your syruping, greatly improve filling accuracy, and effectively remove entrapped air—all at a savings so great that this new FMC Model No. 12 Pre-Vacuumizing Syruper will more than pay for itself in a short period of high volume packing.

You reduce steam requirements up to 1,000 lbs. per hour, not to mention excessive maintenance costs, by completely eliminating the exhaust box system.

Carefully controlled filling accuracy to the exact predetermined headspace, and only *one* transfer of the filled can, means the end of syrup spillage and waste—as well as slack-filled cans. *Comparative tests show a savings in syrup of up to 2¾ ounces per can!*

Smaller can sizes, from 211 to 404 diameter, 300 to 704 height, are handled with comparable efficiency on the FMC Model No. 18 PVS, at speeds up to 275 cpm. Use the coupon to get new bulletin fully describing both of these great PVS models.



Bulletin 801-W is yours for the asking. Just fill out the coupon and mail today. For prompt reply, address office nearest you.

FOOD MACHINERY AND CHEMICAL CORPORATION
Canning Machinery Division
P.O. Box 1120, San Jose 8, Calif. FP
103 E. Maple St., Hoopeston, Ill.

☐ Please send me your Bulletin No. 801-W on FMC's Pre-Vacuumizing Syruper.
☐ Have your representative call.

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7107 on Reader Service Slip.

entry. Package's tare weight is only 55 lb.

Seabrook calculates savings for the first yr, from use of the new wirebounds, will net $19,000 — after spending $10,000 for new mixing and dumping equipment.

Second yr savings, and each subsequent yr, will be $51,560. In addition, according to John M. Douglas, Seabrook's chief engineer, the processor will

Frozen vegetables are poured into polyethylene bag liner inside new wirebound bulk container

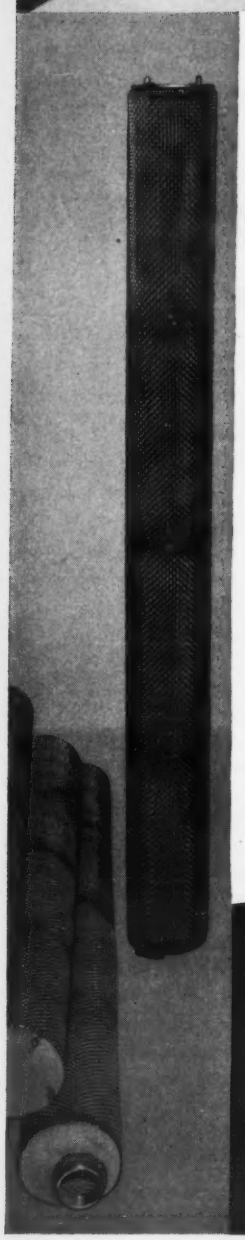
have better use of warehouse space and will eliminate the problem of damage and spillage encountered with multiwall bags.

Even when compared with large corrugated bulk shippers, which Seabrook also has been using, the wirebounds promise initial savings of 15 per cent per unit, and better service. (Example — the corrugated shipper requires a pallet, while the wirebound has a built-in pallet.)

Then too, according to Seabrook, although the corrugated shipper is constructed of 500-lb test board, it has a tendency to break down under moisture conditions.

7109 on Reader Service Slip.

Special opportunities for you in the Classified Advertising section, page 112



Who cares about your Wire Cloth Fabrications?

CAMBRIDGE does . . .

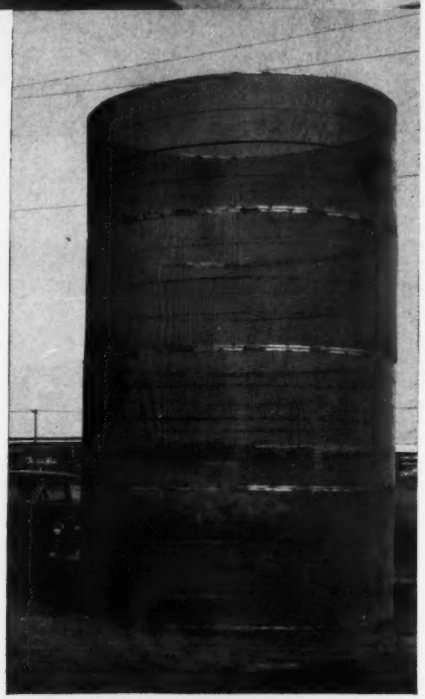
that's why you automatically get service with your order . . . whether you need dozens of midget strainers or a single giant-sized retaining screen.

Careful, competent workmanship and constant inspection assure you of quality . . . modern machinery and accurate scheduling assure you of prompt delivery. And, a Cambridge Field Engineer follows up your order to make sure our product is giving you the best possible service. Let us quote on your next order for wire cloth fabrications. We manufacture wire cloth from any metal or alloy—including titanium—in nine basic weaves. We'll work from your prints or draw up prints for your approval. Call your Cambridge Field Engineer . . . he's listed in the yellow pages under "Wire Cloth". Or, write for FREE 94-PAGE CATALOG.

The Cambridge Wire Cloth Co.

Department H • Cambridge 12, Md.

Manufacturers of Wire Cloth, Metal-Mesh Conveyor Belts, Wire Cloth Fabrications



7108 on Reader Service Slip.

how tac can help users of food chemicals

tac

TAC (Tested Additive Chemicals) is a new quality designation...a grade suitable for approved uses in food. This line is specially produced under strict quality control to more exacting requirements for certain significant impurities than called for by either U.S.P. or N.F. quality standards.

U.S.P. and N.F. specifications for certain impurities are in some cases not adequate for chemicals used in foods. Chemicals to be classified as food grade should be controlled to more strict requirements for heavy metals, such as lead and arsenic, and in certain instances other elements, such as selenium.

As a special service to the food industry, Mallinckrodt has undertaken to make available a line of TESTED ADDITIVE CHEMICALS (TAC) whose purity is rigidly controlled to meet exacting requirements for these elements. This new line of chemicals represents Mallinckrodt's latest achievement in its continuing efforts to provide all segments of industry with fine chemicals of the highest purity.

You will want to know more about TAC chemicals. Simply complete the form below, remove this page, fold, seal and mail. Your inquiry will receive our prompt attention.

(TEAR HERE)

Name _____

Title _____

Firm Name _____

Address _____

City _____ Zone _____ State _____

MALLINCKRODT CHEMICAL WORKS St. Louis 7, Mo. New York 8, N. Y. Montreal, Canada

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tac

Postage Will be Paid by Addressee

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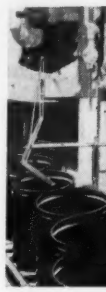

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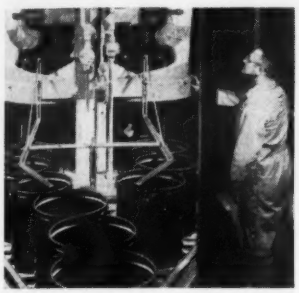
For more

Break steel pail production bottleneck!

Apply pail linings at high speed

High production rates in manufacture of one- to five-gal lined steel pails have heretofore been slowed by steps involved in uniformly applying high-quality linings to assure freedom from pinholes, thin spots and foreign matter.

New centrifugal lining process applies to smaller steel containers the established advantages of centrifugal application—developed originally for 55-gal steel drums, and described in FP, May 1957—at the high production speeds required.



Twin line of five-gal steel pail bodies moves automatically into position for application of specification lining by centrifugal process

The development makes available at practical cost sufficient steel pails with linings especially formulated and evenly applied to protect each of the many existing and new products that require such containers.

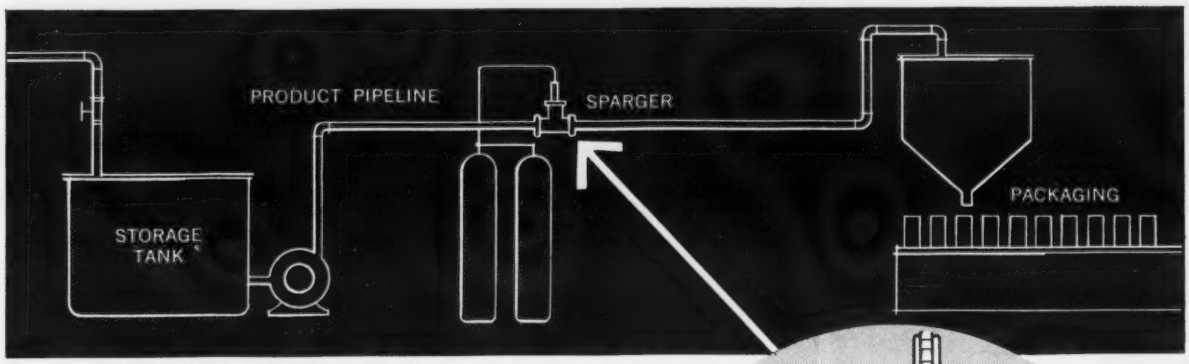
Centrifugal method of applying special-formula linings eliminates a wide range of problems ordinarily encountered when linings are applied by spraying.

With the lining material being atomized by centrifugal force, the amount of solvent present in the material is greatly reduced, and the danger of developing pinholes or blisters during the subsequent curing is minimized.

Dirt-entraining air turbu-

GAS SPARGING

. . . an exciting new method of treating foods and beverages to insure retention of important customer acceptance qualities



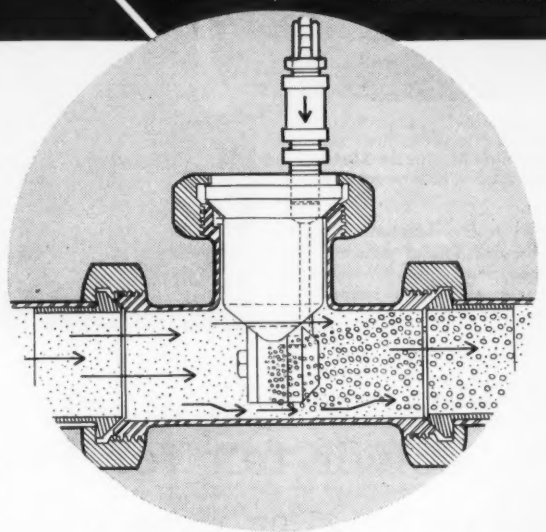
. . . the unique

AIRCO GAS SPARGER

is utilized for reducing product oxygen and improving the shelf life, appearance and texture of processed foods and beverages. Sparging is done during the processing flow and involves little or no disturbance of existing equipment. Specifically, sparging with nitrogen, carbon dioxide, nitrous oxide, oxygen and argon accomplishes the following —

- Removal of oxygen from oxygen-sensitive liquids such as citrus juices, edible oils and essential oils, wines, etc.
- Fluffing of mayonnaise, salad dressings, peanut butter, ice cream, etc.
- Controlled fermentation of wines.
- Light carbonation of wines and other beverages.

The Airco Sparger is remarkably easy to install and low in cost. Check further as to the profitable possibilities of gas sparging your products. For a copy of a descriptive folder on Airco's Gas Sparger, please send coupon today.



Close-up view of Airco Sparger in action.

At the Frontiers of Progress You'll Find an Air Reduction Product

AIR REDUCTION COMPANY, Inc.

CUSTOMER SERVICE PACKAGING LABORATORY

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AIRCO

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☐ Please send complete information on Sparging.

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Company.....
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City.....Zone.....State.....

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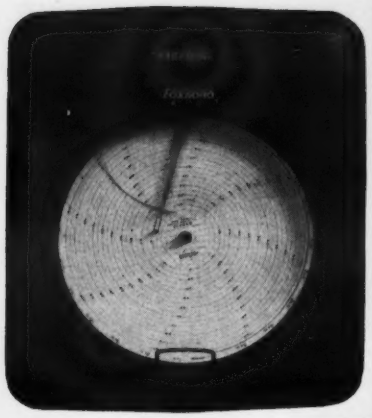
For more information on product at left, circle 7110



▲ Foxboro Dynalog electronic receiver records flow passing through Magnetic Meter — logs total in gallons per minute.

8" Foxboro Magnetic Meter ▶ measures flow of effluent into town sewage system — sends linear signal to recording instrument by electric cable.

Foxboro Magnetic Flow Meter reduces sewer tax for Pennsylvania cannery

Sewage billed on meter readings instead of water consumption

D. E. Winebrenner and Company, Hanover, Pa. had a problem. The Town of Hanover was assessing them a Sewage Tax based on the Cannery's water meter reading. In canning season, however, as much as 25% of the plant's water consumption went into the cans of peas and corn which they process.

Solution: installation of a Foxboro 8" Magnetic Flow Meter in the sewage line carrying effluent from the canning process. The town now bills on Dynalog* recorder readings, and Winebrenner pockets the savings.

The Foxboro Magnetic Flow Meter can help you cut processing costs in many other ways. Since it has no flow restrictions of any type, juices, starch slurries — even liquids as thick as molasses — can be metered accurately, continuously. There's nothing to foul or plug up. Linear measurement is made by electrodes flush-mounted in meter wall — signal carried by electric cable to a Dynalog receiver-recorder. Meter and receiver seldom — if ever — require maintenance.

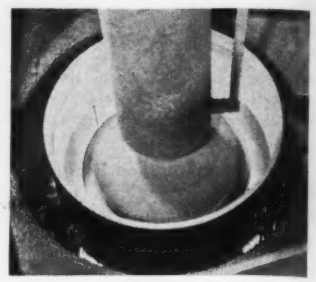
Ask your Foxboro Field Engineer to show you how the Magnetic Flow Meter can save you money and increase the efficiency of your plant. Or write for Bulletin 20-14. The Foxboro Company, 9212 Neponset Avenue, Foxboro, Massachusetts. *Reg. U. S. Pat. Off.*

FOXBORO
REG. U. S. PAT. OFF.

7112 on Reader Service Slip.

lence is eliminated by absence of air pressure as a propellant, and by lack of rotation of the container body being lined.

The pail body is elevated automatically on the same axis as that of the rapidly revolving centrifugal applicator.



Spinning rotor of centrifugal lining applicator is shown as body of a five-gal pail starts its up-and-down pass

Lining material is deposited on both the upward and downward travel, giving complete and uniform lining coverage to the entire length of the pail body.

Supplier: One- to five-gal steel pails with specification linings applied by patented centrifugal method are manufactured by Rheem Manufacturing Co., Container Division, 1701 W. Edgar Rd., Linden, N.J.

7113 on Reader Service Slip.

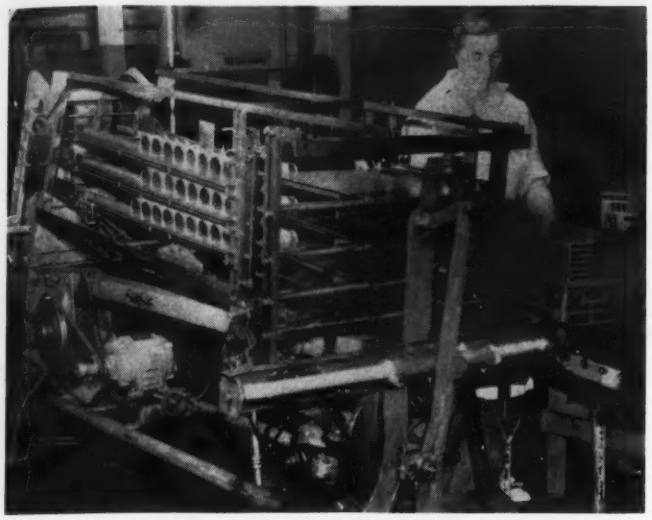
Explains "whys" of auger filling—how to select filler

Illustrated eight-page bulletin P-811 explains the basic principle and inherent advantages of auger filling for powder, paste and granular products.

Schematic drawings show the four methods available to accurately weigh, pack, and vacuum-fill or volumetrically fill containers.

Text and pictures point up features and methods of fill offered on each of 11 standard FMC models. A comprehensive chart lists speeds, weight ranges and container sizes for easy evaluation of each machine.

7114 on Reader Service Slip.



Units of the type used at B&M can be adapted to pack any type of filled can — including fiber and aluminum cans

For Burnham & Morrill's quality packing operation . . .

'Gentle action' can packers up productivity, cut costs

Burnham & Morrill of Portland, Me. — one of the nation's oldest and most respected canners — uses automatic equipment in food processing and packing only where such machines do not, in the opinion of company officials, lower production standards in the course of raising production efficiency.

Because they "gentle" the cans as they come off the line into cartons, the company has been able to take advantage of three automatic can packers which have lowered operational costs in the packing department by 20 per cent, have speeded production and have eliminated one operator per machine per shift.

The C&K standard can packers — manufactured by Crompton & Knowles Packaging Corp., 100 Berkshire St., Holyoke, Mass. — receive cans in a single line from the closing and labeling machines.

By means of a booster distributor, cans are divided into a double line to be distributed in a predetermined pattern into runways.

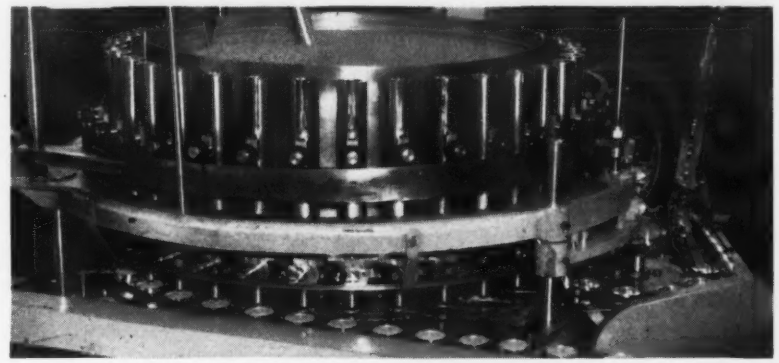
Positive can control guides each can into proper position in the load-forming section. This prevents twisting and assures a complete pack. Control is air-operated, and lifts out of the way automatically as cans are discharged into the case.

Seven sizes of cans are packed at B&M, in addition to three jar sizes. All cans pass through the standard can packers, which have a speed of up to 25 cases per min.

While a large share of the can pack consists of internationally known B&M Brick Oven Baked Beans and B&M Brown Bread, it also includes beef, chicken and lamb stews, Welsh rarebit, corn relish, apple sauce, macaroni-and-cheese, baked Indian pudding, fish flakes, codfish cakes, clam chowder, squash, sweet corn and stringless beans.

7115 on Reader Service Slip.

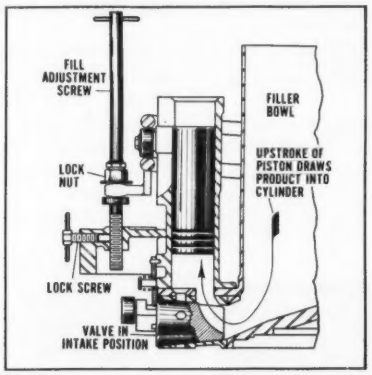
FLUIDICS* AT WORK



How to evaluate piston filler design in terms of profits

Take a look at the *total* design approach in a Pfaudler® rotary piston filler and you'll see how *every* factor can contribute to profits.

Start with the piston. Here you have the proper combination of smooth fit and small "cushion" so you can handle



products ranging from light, to heavy viscous fluids.

Accuracy is ±1/10 fluid ounce for most products. There's no surging, no splashing, no piston leakage.

Next check the *fill adjustment mechanism*. With a Pfaudler filler you can adjust fill accuracy from a single control point without dismantling or even stopping the filler.

Cleaning is simple and rapid. One man can do it thoroughly in one-half hour. He can do it without tools or hoists by removing only two parts per station, the piston and valve. There are no gaskets to clean and refit, no adjustments to make after cleaning.

Lubrication is well provided for, since all grease fittings are tied in to very accessible headers. And all gears are submerged in oil.

Repairs are kept to a minimum, since there are only four primary wearing parts—piston and valve rollers, valve trip cam, and valve-lock wear pad. You will find that all are modestly priced, easy to stock and replace.

Over-all weight, and how it is supported, also should be considered. The sturdy base and over-all ruggedness are a hallmark of every Pfaudler filler.

Name the product, rate and container and you'll find a Pfaudler filler to handle it profitably. Choose from machines with 6 to 36 stations, to handle glass, paper, prepack or tin.

Get detailed specs by writing to our Pfaudler Division, Dept. **FP-120,** Rochester 3, New York.

*FLUIDICS is the Pfaudler Permutit program that integrates knowledge, equipment and experience in solving problems involving fluids.

PFAUDLER PERMUTIT INC.
Specialists in FLUIDICS . . . the science of fluid processes

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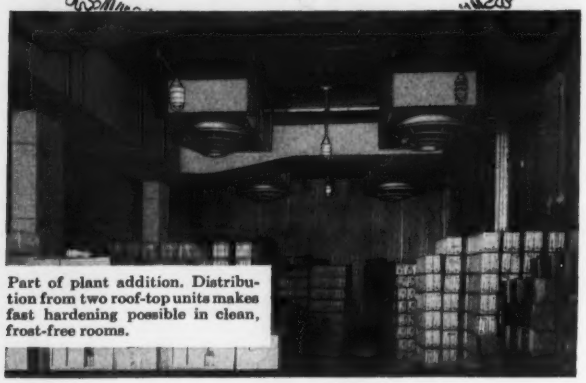
DAIRYMEN'S ASSOCIATION LTD., HONOLULU . . .

Enlarged ice cream manufacturing plant locates

KING UNITS

on roof for increased hardening room capacity



Part of plant addition. Distribution from two roof-top units makes fast hardening possible in clean, frost-free rooms.

During the recent expansion of this fine ice cream manufacturing plant in our newest state, Dairymen's Association, Ltd., replaced a troublesome system with a trouble-free King Sharp Freeze installation.

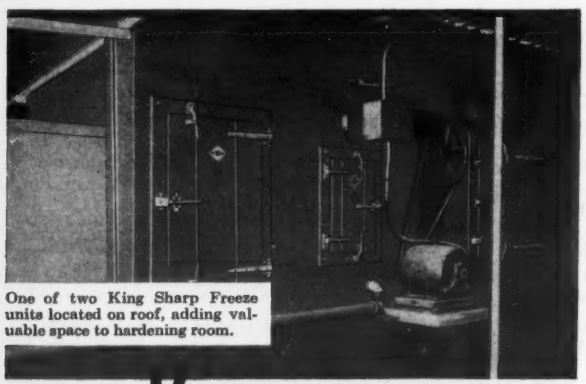
Improvements brought about by the King system are:

1 Four floor type blower units, previously occupying valuable space in the hardening room, have been replaced by two King Sharp Freeze units located on the roof above the room.

2 A 25° to 30°F. room temperature rise during defrosting of the old units has been eliminated with the King Sharp Freeze installation, improving the product texture immeasurably. This is possible because the King units are independent of the room during defrosting.

3 Frost problems in the hardening room, due to the very high humidity in Hawaii, have been alleviated completely.

Why not find out how King engineers can reduce sharp freezing and storage costs, help you maintain high quality products and improve your handling operation? More than 50 years' experience on installations in over 60% of the nation's largest plants, is at your service.



One of two King Sharp Freeze units located on roof, adding valuable space to hardening room.

Write for free technical bulletin

SHARP FREEZE SYSTEMS

King COMPANY OF OWATONNA

911 N. Cedar St., Owatonna, Minn.

7117 on Reader Service Slip.

packaging

Practical guide on canning carbonated beverages

Canning contractors and bottling companies interested in entering the booming canned soft drink market, will find new 28-page guidebook — "The Canning of Carbonated Beverages" — bubbling with details.

Included is discussion of raw materials, beverage preparation, the canning operation, regulations, sanitation, quality control, cans, container performance and shelf life.

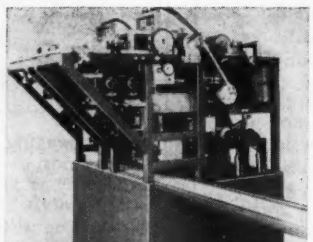
The structure of soft drink cans is described, along with filling and sealing methods and machines. New booklet is companion to brochure — "Carbonated Beverage Canning Lines" — which describes the equipment and capital investment necessary for setting up soft drink canning lines.

7118 on Reader Service Slip.

Automatically forms, fills, seals leak-proof pouches for liquids, creams, pastes

Uses-Features: Speedway Model LF-60 automatically forms leak-proof packages from roll stock of cellophane, foil, pliofilm, polyethylene or laminated combinations.

Package sizes range from one to 12 in. long, and from



High-speed unit (illustrated) has two packaging stations; one-station model also is available

¼ in. to 8½ in. wide. Virtually any combination of single or cluster packages within this range can be produced.

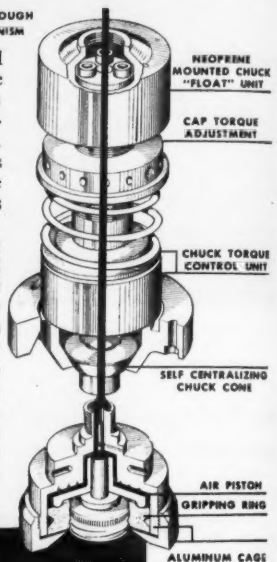
Description: Employing two independently operated pack-

FINICKY CAPS FITTED *automatically . . .*

and fed with the gentlest action known!

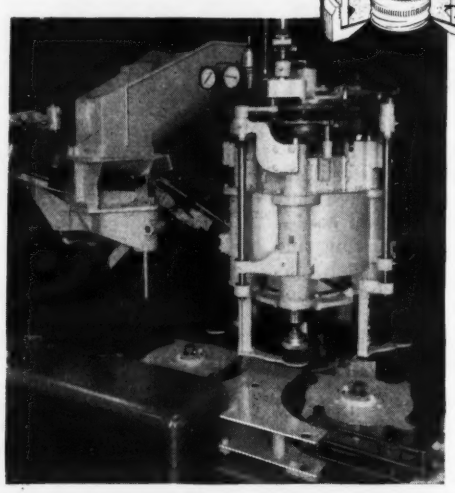
by

PNEUMACAP



Gently gripped and turned by the air activated neoprene "doughnut" in Pneumacap's new air chuck, the most delicate cap can meet no harm. What's more, cap variations and difficult designs are handled in stride with this remarkably flexible chuck.

Standard equipment on one, four, six or eight-head Pneumacap Cappers, the Sterling Cap Feeder automatically sorts and feeds without churning, marring or breakage. Machine has "no bottle — no cap" safety — a basket is not required to catch excess caps. Feeder action is controlled by Capper operation which "calls" for caps only as needed.



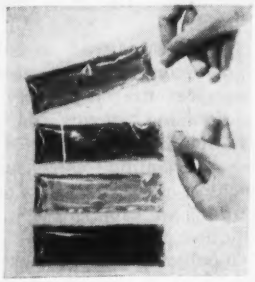
PNEUMATIC SCALE CORP., LTD., 75 Newport Avenue, Quincy 71, Massachusetts. *Also: New York; Chicago; Dallas; Rochester; Rockwell Pneumatic Scale Ltd., London, England.* Agents: *Fred Todt Company at Los Angeles, San Francisco, and Seattle.*

PNEUMATIC

7119 on Reader Service Slip.

aging stations, machine has a variable speed of 15 to 36 strokes per min. Thus, with each station producing a cluster of four packages, capacity is from 120 to 288 packages per min.

Since there are no electronic or other complicated parts, unit can be operated and maintained by semi-skilled



Single packages or virtually any combination of cluster packages can be produced

workers. Base dimensions are 44 by 48 in.; height is 6½ ft; power requirements are 115-230 v, 60 cy, single phase.

Machine is adaptable by the manufacturer to fit individual needs — including packaging dry materials.

Supplier: Speedway Machine & Tool Co., Inc., 1802 N. Luett St., Indianapolis 22, Ind.

7120 on Reader Service Slip.

Complete guide on setting up soft drink canning line

Establishment of canning lines in three speed ranges to illustrate low-, medium- and high-speed production — 150-300 cpm, 300-500 cpm and 500-750 cpm — is comprehensively explained in new brochure, "Carbonated Beverage Canning Lines."

In addition to fully describing the equipment necessary, brochure gives estimated costs for every step in setting up such an operation. Consolidated totals show realistic capital investment for the line.

Covered are such aspects as a syruping system, pre-mix system, handling of empty cans, filling and closing equip-

SCOTCH BRAND

TAPEnology... industry's newest cost-cutting tool

"Tattle-tale" tape stripes itself under heat, gives you positive proof of sterilization

Here's a fast, easy, food sterilization testing-technique you can use right now. Simply tab a short strip of "SCOTCH" BRAND Autoclave Tape No. 222 to various "judas" cans being sterilized. When steam-heat pressure in retort reaches 240° F. or more, dark-colored stripes appear on tape—indicating everything's OK. Failure of stripes to appear "tattles" that proper sterilization hasn't occurred and that cans should be placed back in retort.

On in seconds—"SCOTCH" Autoclave Tape adheres to cans throughout sterilization and cooling. Peels off easily at time of packing. Tape tabs can be written on with ink, pencil or crayon—tabbed to production records as proof that batch passed test.

With "SCOTCH" Autoclave Tape you can spot-check against improper processing in vertical or continuous retorts in minutes. Positive proof of sterilization assures dollar savings—permits cutting spoilage losses to less than 0.01%.

What do you process? The ingenuity and technical resources of your 3M Representative are at your service. Ask your "SCOTCH" BRAND Tape Distributor or write: 3M Company, 900 Bush Avenue, St. Paul 6, Minnesota, Dept. IAD-120.

When tape costs so little, why take less than "SCOTCH" Brand?

"SCOTCH" IS A REGISTERED TRADEMARK OF 3M CO., ST. PAUL 6, MINN.
EXPORT: 99 PARK AVE., NEW YORK 16. CANADA: LONDON, ONTARIO

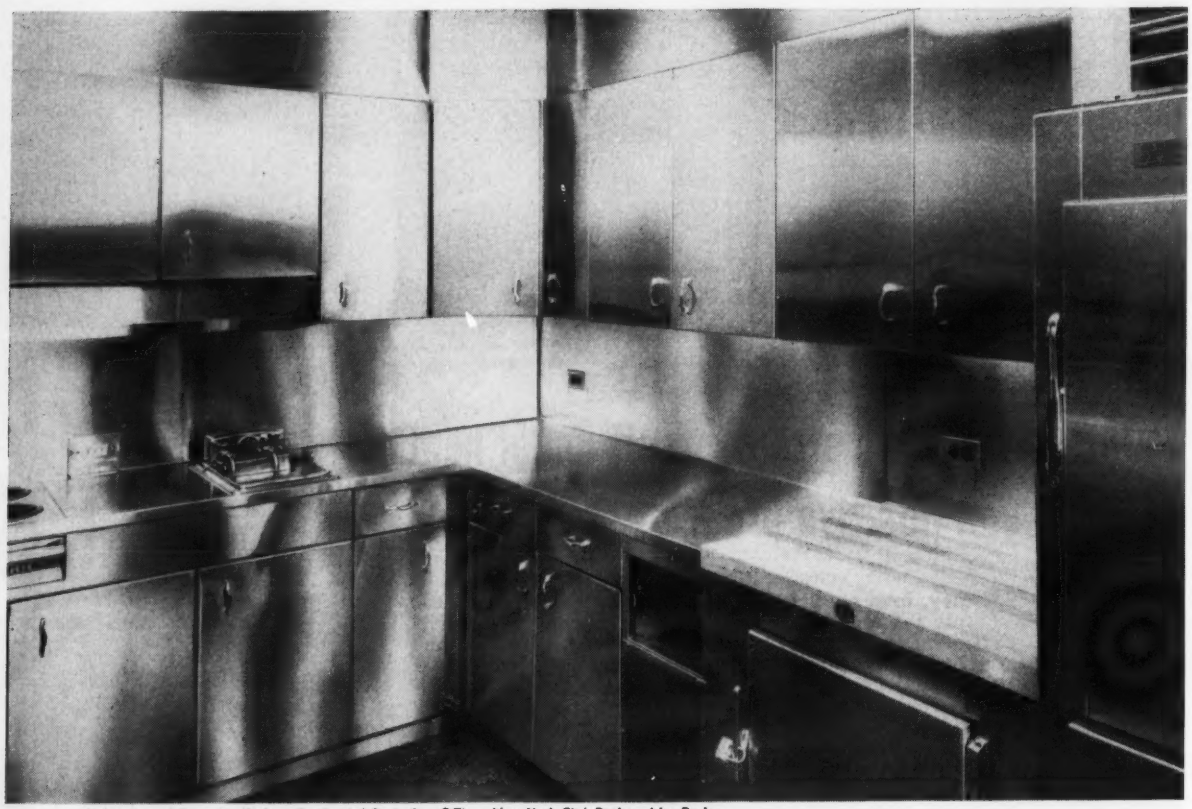
MINNESOTA MINING AND MANUFACTURING COMPANY
...WHERE RESEARCH IS THE KEY TO TOMORROW

3M COMPANY

SCOTCH BRAND
SCOTCH BRAND
SCOTCH BRAND
SCOTCH BRAND
SCOTCH® BRAND
SCOTCH BRAND

7121 on Reader Service Slip.

"All exposed and unexposed surfaces shall be of STAINLESS STEEL..."



Cafeteria and Executive Kitchen, *Continental Grain Co., Offices:* New York City. Designed by *Designs for Business, Inc.*, New York, N. Y. Fabricated by *Stainless Food Equipment Co.*, Newark, N. J. Installed by *Ben Mernit*, New York City

The specifications for this executive cafeteria called for all kitchen metal surfaces, both exposed *and* unexposed, to be constructed of stainless steel. Only *lifetime* stainless steel can offer the durability and ease of maintenance necessary for maximum sanitation in food handling.

MICROROLD STAINLESS STEEL was chosen for its consistent uniformity of gauge, outstanding finish and well-known fabricating qualities.

Why not investigate the advantages of stainless steel for your next project?

WASHINGTON STEEL CORPORATION
12-W WOODLAND AVENUE • WASHINGTON, PENNSYLVANIA

7122 on Reader Service Slip.

ment, processing equipment and filled can packaging.

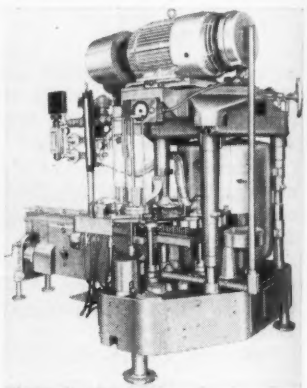
Various-speed canning line layouts are graphically illustrated by means of fold-out schematic diagrams.

7123 on Reader Service Slip.

Describes unit that closes 1000 cans per min

Special features such as power-driven base plates that eliminate the possibility of deadheading during double-seaming are incorporated in new 10-station can closing machine described in Continental Can Company four-pg bulletin.

Capable of closing cans less than 3 7/16 in. in diam at



Unit can be equipped with parts for undercover gassing or for undercover steaming

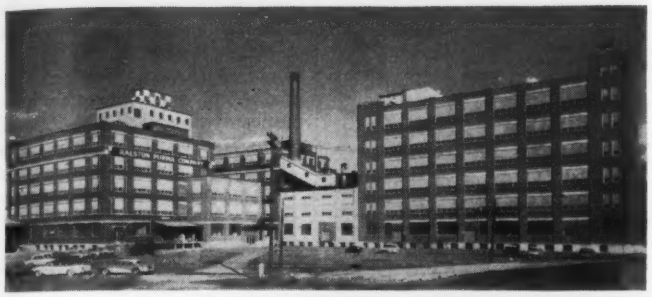
speeds of over 1000 cpm (depending upon can diam and product being packed), the 449-HCM-2 can be changed over to handle different can heights in one-half hr, to handle different can diameters in seven hr.

Within certain limits changes for running cans of different heights can be made simply by turning one crank.

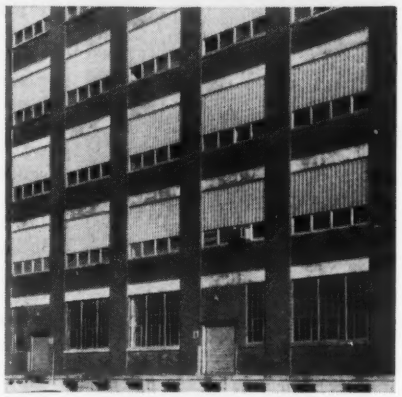
High-speed transfer mechanisms for all types of can fillers assure smooth, non-spill movement of cans from filler through the closing machine.

In addition to specifications, literature provides a travel diagram and an erecting diagram.

7124 on Reader Service Slip.



View of Ralston Purina's Battle Creek plant shows three of the four buildings using combination glass blocks and ribbon ventilator sashes. This plant, one of five in the grocery division, makes Wheat Chex, Rice Chex, Corn Chex and Corn Flakes



Close-up of the new windows shows how the top two-thirds of each bay is filled with glass blocks and the lower third with the aluminum ventilator sashes

Glass block windows provide easier cleaning and maintenance

Combined with aluminum ribbon ventilator, installation offers substantial savings in window washing; eliminates need to replace broken panes

Ralston Purina Company, the Battle Creek, Michigan, ready-to-eat breakfast cereal plant, was faced with the problem of replacing 311 bays of windows, totalling 32,344 square feet, in four buildings.

The windows, which had not been replaced in some cases for as long as 40 years, were so badly warped out of shape that many would no longer close properly.

This caused heat from the cooking rooms to moisturize and condense on the windows, resulting in a never-ending battle to control corrosion.

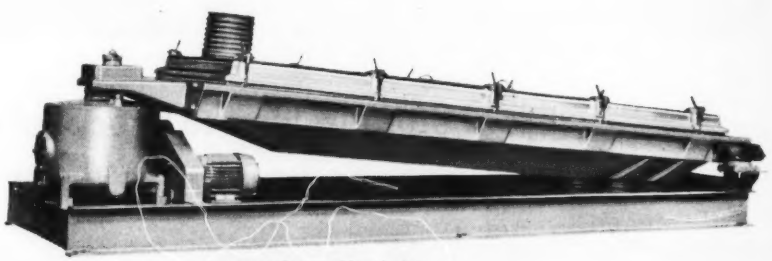
Realizing that the windows had to be replaced, Richard C. Lind, Plant Superintendent, and Albert L. Tanyer, Plant Engineer, set aside three bays of windows to test several type combination sash and windows.

Included were four different types of glazed aluminum type sashes made by three different manufacturers, as well as glass blocks combined with an aluminum ribbon ventilator sash window. While the glass blocks were more expensive than the glazed sash, the difference was not as prohibitive as was expected.

This slightly higher cost was minimized even further when results of the test indicated

APPROVED

new sanitary screeners by Rotex



new screening machine design
meets the nation's most rigid sanitary codes
separates wet or dry materials with greater precision
quickly cleanable and completely dust tight
constant screen tensioning and fast screen changes (pat. pend.)
high production capacity . . . no screen blinding
unexcelled workmanship . . . rugged construction
wide range of models for small or large capacities

write or call . . . our experienced engineers
will be pleased to cooperate with you

ROTEX®

THE ORVILLE SIMPSON CO., CINCINNATI 23, OHIO

7125 on Reader Service Slip.

that the glass block aluminum ribbon ventilators offered the greatest advantages.

First, the glass block installation was more maintenance free than the glazed sash. Previously, Ralston Purina had spent considerable time replacing broken panes. Since the glass blocks are permanently mortared into place, caulking, paint, etc., could be eliminated entirely.

Furthermore, a substantial savings in window washing could be realized. The old glazed sash windows had to be washed both inside and out four times a year. The outside washing required dropping a scaffold each time washing took place.

With the glass block installation, it was estimated that outside washing could be reduced to only once a year. Actual use has proved this estimate to be true.

Another advantage of the glass blocks, which was brought out in the tests, was the incorporation of a green tinted fibrous glass mat, dividing the inner area into two air spaces. These types of glass blocks not only cut down glare, but also offered much better insulating qualities, which would provide some savings in heating costs.

Because the tests conclusively proved that the combination aluminum ribbon ventilator sash provided the best results, installation was started immediately.

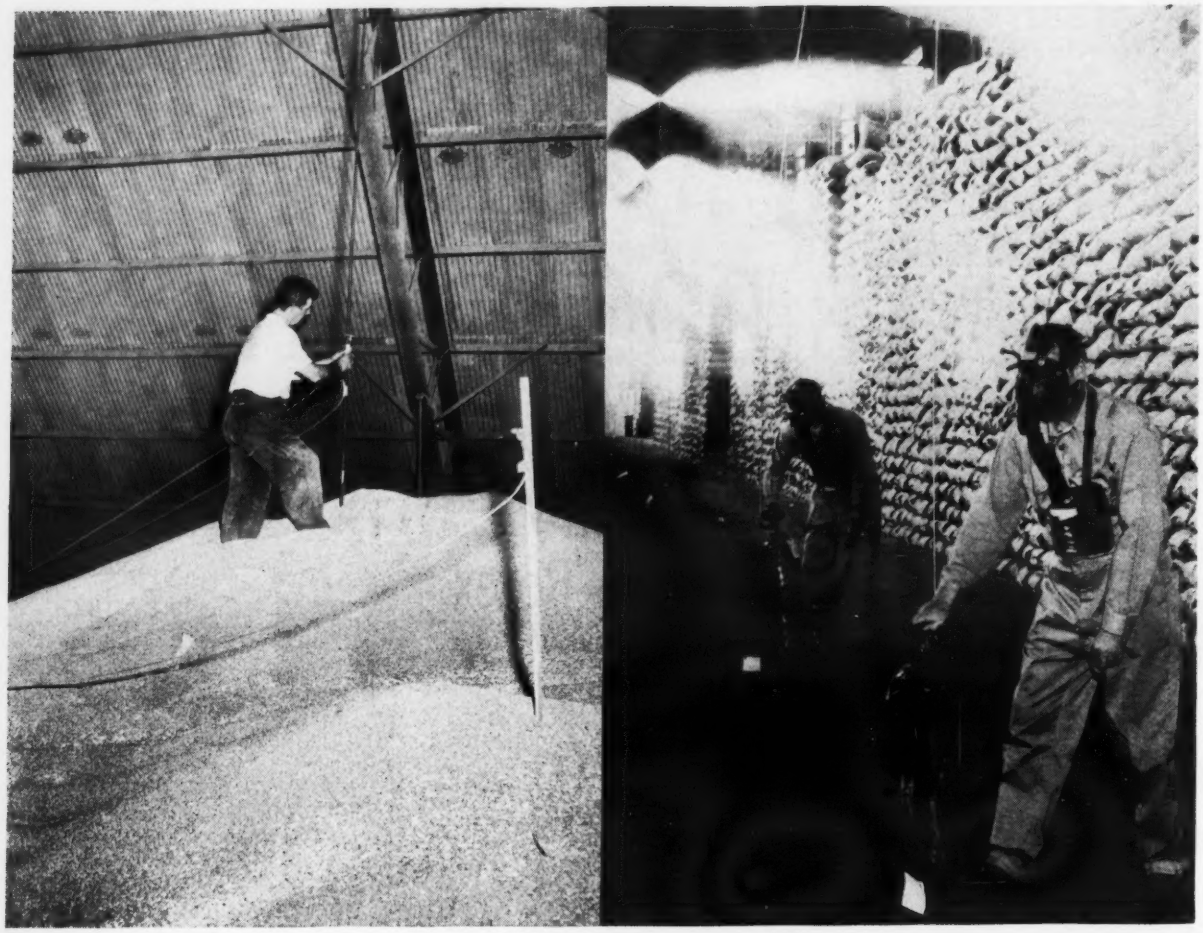
Windows were installed in groups of six to eight bays at a time, which were barricaded off from production areas while work was underway. Thus, breakfast cereal production was not halted.

Entire installation, requiring 21,652 square feet of glass blocks, was completed by a 30-man crew in three months.

The blocks, provided by the Pittsburgh Corning Corp., Pittsburgh, Pa., have a smooth inner face. This special design was requested by Ralston Purina since they pointed out that the smooth inner surfaces would obviously be easier to keep clean than the usual rippled face.

According to Mr. Lind, re-

DOW | FUMIGANTS



From storage bins to processing plants . . .

PROTECT STORED PRODUCTS WITH DOW FUMIGANTS

Whether you store bulk food, process it, or ship it, there's a Dow fumigant designed to protect your products from devouring or damaging attacks by over fifty different types of insects and rodents.

Use Dow Methyl Bromide for almost every method of fumigation – space, chamber, tarpaulin, boxcar or forced-air recirculation of bulk grains. Methyl Bromide quickly penetrates throughout all parts of the stored product; controls all forms of insects and rodents; and leaves no residual tastes or odors.

Use Profume® (98% methyl bromide, 2% chloropicrin) for the same applications, but where a slight warning odor is desired.

Use Picride® (80% methyl bromide, 20% chloropicrin by weight) in loosely constructed buildings where there might be a question of holding a lethal concentration of methyl bromide. Or if insects infest your processing machinery –a treatment with Dowfume® EB-15 will give a fast initial kill, and long-lasting residual control.

Used according to directions, Dow Fumigants will impart no residual odors or taste to grain or fully prepared commodities, they will not affect milling qualities, they present no appreciable fire risk . . . they are the most economical insurance you can have for protecting your investment in stored products.

Call your nearest Dow sales office for full information on the proper Dow Fumigant for your storage application. Or write: THE DOW CHEMICAL COMPANY, Agricultural Chemicals Sales Department 224BH12, Midland, Mich.

Products Advertised Herein Comply with U. S. Law
When used as directed on label and in accordance with good practice, they comply with the Food and Drug Law and other Federal Laws.

THE DOW CHEMICAL COMPANY · MIDLAND, MICHIGAN

7126 on Reader Service Slip.

sults after two years installation have proved to be most satisfactory and window maintenance costs have been cut drastically.

An extra bonus with the glass block and ventilator sash combination is the ease with which screens can be installed. Previously, the window sashes had opened outward, necessitating awkward, semi-circular screening. Ventilator sashes, which open inward, are covered with flat screening.

7127 on Reader Service Slip.

Jet cleaner mounted at hose station

Uses: A "Super Booster," cleaner made by the Sellers Injector Corp. is used to remove dirt, grease or food burn on. A powerful discharge of water and detergent will scrub walls, floors or equipment.

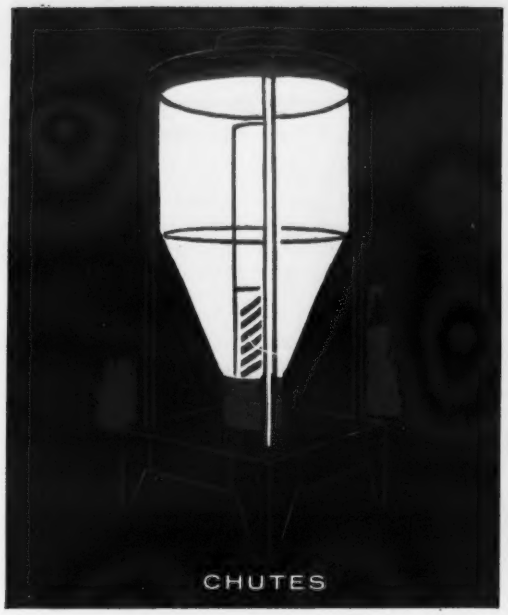
Features: This small steam powered hydraulic cleaner is adaptable to solving sanitation problems in hard to get at positions. It can be mounted close to hose stations or centered in areas requiring extensive cleaning effort.

The equipment utilizes the steam energy to build up jet pressures in excess of the combined water and steam input pressure. For instance a cleaner operating with 5 psi of steam and 10 psi of 60°F water will deliver 175°F water at 100 psi. Also a cleaner operating with 150 psi of steam and 40 psi of water at 60°F will deliver 205°F water with a pressure of 630 psi.

The amount of detergent injected is determined by 1.—by the concentration of stock solution, 2.—a valve adjustment determines the volume of detergent mixing. The solvent used may be changed according to the requirements of the cleaning job.

Description: Available in three sizes. Designed for steam supply pressures ranging from 5 psi to 150 psi. Steam supply line should be 1½ inches to 2 inches in diameter. Complete details are presented in a 4 page bulletin No. 446.

7128 on Reader Service Slip.



Plexiglas keeps contaminants out—profits in!

clear sheets and transparent or translucent colored sheets. Authorized distributors are listed under PLEXIGLAS in the Plastics section of telephone directories in major cities.

Windows, partitions, skylights and lighting shields in food processing areas are ideal glazing applications for PLEXIGLAS, the durable plastic that "gives" with a blow.

Machines, containers and conveyors can be protected from contamination, with transparent hoods, lids, covers and see-through sections of impact-resistant PLEXIGLAS.

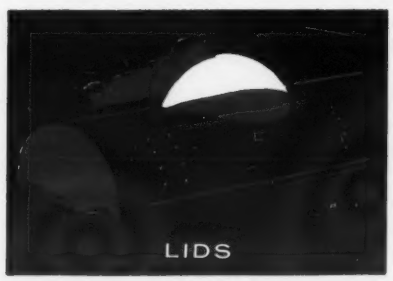
You don't have to worry about corrosion or weathering when you install PLEXIGLAS—available in crystal clear sheets and transparent or translucent colored sheets. Authorized dealers are listed under PLEXIGLAS in the Plastics section of telephone directories in major cities.

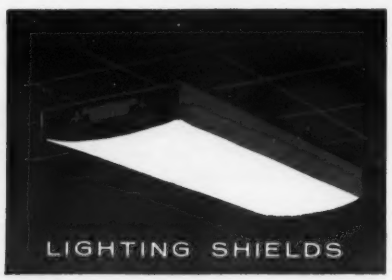
Chemicals for Industry

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

In Canada: *Rohm & Haas Company of Canada, Ltd., West Hill, Ontario*





CALL YOUR AUTHORIZED PLEXIGLAS DISTRIBUTOR

PROMPT DELIVERY • TECHNICAL ADVICE • FULL RANGE OF SIZES AND COLORS

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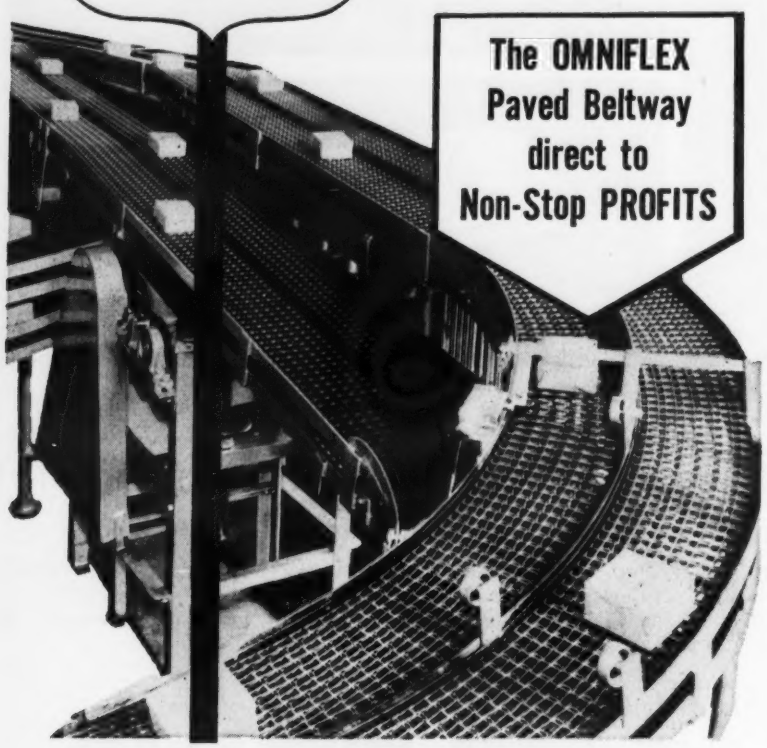
ROUTE 180° OUT OF WINCHESTER . . .



Just look at this picture. It is truly amazing the shapes, contours, curves and combinations that can be engineered from patented OMNIFLEX Belts manufactured only by Ashworth Bros., Inc. This particular installation, that looks so much like a modern super highway interchange, carries crackers from wrapper to carton machines, continuously without transfer, through numerous 180° turns.

The solution to uninterrupted product flow during your continuous processing operation may not require as complicated a setup as did this problem. Chances are your need can be met with a standard Ashworth design; but, where analysis of service requirements indicate special design, Ashworth Engineers can do the job.

Engineering, plus accurate selection of wire analysis, plus careful fabrication insure quality woven into every Ashworth belt. You can depend on Ashworth to carry the load . . . continuously.

Consult your nearest Ashworth Sales Engineer or write directly to:

ASHWORTH BROS., INC.
WINCHESTER, VIRGINIA
Sales Offices in Principal Cities

7130 on Reader Service Slip.

sanitation

Sanitation standards 18, 19 on equipment

Emulsifiers, homogenizers and spindle mixers are the subject in latest series of standards. Published by Baking Industry Sanitation Standards Committee in a 16 page booklet.

Two standards are covered in this booklet. First is Sanitation Standard No. 18 for Emulsifiers and Homogenizers. This standard applies to differing types of equipment used for blending or intimately mixing two or more ingredients.

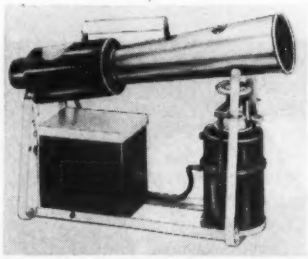
Sanitation Standard No. 19 for Spindle Mixers applies to spindle mixers having multiple spindles and using portable dough trough as a mixing compartment.

Copies are available for 25 cents each from American Society of Bakery Engineers, room 1354, LaSalle-Wacker Bldg., 121 West Wacker Drive, Chicago 1, Ill.

Chase birds with automatic sound cannon

Portable unit operates on generated acetylene gas

The way that pigeons were successfully chased from Esso Research and Engineering Co. should be of interest to food processors. Numerous pipes



Portable scarecrow is three feet long

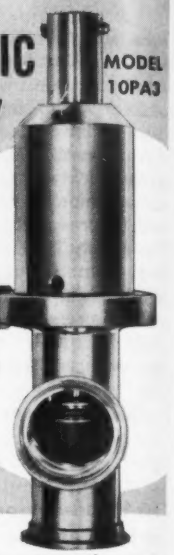
and catwalks in the five-story refinery tower became an attractive roosting place.

To get rid of persistent pigeons various methods tried were: flashing lights, applications of sticky and irritating

Introducing the

A·P·C AUTOMATIC SANITARY VALVE

MODEL 10PA3

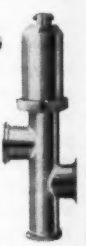


- STAINLESS STEEL
- PISTON CONTROLLED
- AIR OPERATED

Now you can have automatic, problem-free flow control of food and dairy processes with A-P-C's new remote operated sanitary valves. Highest sanitary standards and full C.I.P. cleanability.

Flow control with A-P-C's automatic, sanitary valves saves you money by cutting maintenance costs and eliminating product waste. There are no air losses to the product and no product leaks to the valve mechanism.

A-P-C'S new automatic sanitary valves are made of heavy duty stainless steel . . . precision made for long service life. Springless operation guarantees positive action and eliminates breakage problems. Valve position, either open or closed can easily be seen, even at a distance.



11PAA Series Valves—Available with 3 to 6 ports in many arrangements. The porting on this valve makes it useful for straight line header assemblies to raw and finished product storage tanks. Also ideal for filler header lines.

11PAE3 Diverting Valve — Up to five ports available on valve body. Typical application includes vat or tank selection; diverting finished product when surge tanks are filled or supplying alternate process lines.

The 10PA3 A-P-C Valve shown in main illustration and its companion valve 10PA are used as shut-off valves for filling and emptying vats and tanks. 10PATF, a flange outlet valve is also available for mounting on existing tanks and vats.

Ask your Creamery Package representative to demonstrate the A-P-C Automatic Sanitary Valve soon.

Sold Exclusively by the

Creamery Package MFG. CO. *for*

ALLOY PRODUCTS CORP.

1076 Perkins Avenue • Waukesha, Wisconsin

7131 on Reader Service Slip.

compounds to the roosting places, etc.

Finally the Department of the Interior was consulted and the recommendation was to use a Zon Automatic Scarecrow. After a weeks trial it was pronounced a success.

Automatic Scarecrow is designed to chase birds away by producing intermittent explosive reports every four or five minutes. Noise is produced by an internal combustion explosion which is amplified by a megaphone, three feet long.

Fuel supply is acetylene gas from a carbide generator or a Prestolite tank. A valve regulates the flow of gas and its adjustment determines firing intervals. Flowing gas drives a piston which cocks the flint firing mechanism.

A timing device controls the hours of operation. Time control will cycle the operating schedule to create disturbances at the time when birds are seeking a roosting place.

Supplier: B. M. Lawrence & Company, 244 California St., San Francisco, Calif.

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Prevents corrosion in circulating systems

A chemical product containing polyphosphates will deposit a corrosion protective film on metal surfaces.

The compound, known as Banox, is added to water in circulating systems. Refrigeration, ice banks, water tanks, cooling towers and brine systems are examples. Metal surfaces of condensers pipes and pumps are also protected.

Canned products are protected from package corrosion in storage. This is accomplished by adding the protective compound to raw water used for cooking the packaged food.

Polyphosphates in the compound form a film in a few hours after treatment. The film is about ten millionths of an inch thick. It acts as a barrier to corrosive conditions such as water ladened with carbon dioxide or oxygen.

High electrical resistance

Performance makes the world of difference

Fig. 2453SG—Large Stainless Steel O. S. & Y. Gate Valve for 150 W.P. Fully guided solid wedge disc. Also available with interchangeable split wedge disc — Fig. 2453DG.

Fig. 2433SS — Large Stainless Steel Swing Check Valve for 150 W.P. Bolted flanged cap. Integral seat. Teflon disc and renewable seat ring are available on special order and at extra price.

Fig. 2309—Large Flush Bottom Tank Valve for 150 W.P. Designed for fast draining. Disc opens into tank. Also available with disc opening into valve — Fig. 2310.

Fig. 2107 — Small Stainless Steel "Y" Valve for 150 W.P. Flanged ends, but can be supplied with screwed or socket welding ends. Dimensions conform to latest standards.

To control the flow of corrosive fluids in the most severe services, Powell offers valves that have far greater corrosion, erosion, heat and wear resistance than ordinary valves.

Among the many metals and special alloys in which these valves can be supplied are Stainless Steel, Nickel, Monel Metal*, Hastelloy† Alloys, Ni-resist*, Aluminum, and others to handle the acids, alkalies, organic solvents, and gases encountered in the Chemical and Process Industries.

Just name your valve problem—Powell has the right valve to solve it. For complete information and literature, contact your Powell Valve distributor (there's one in all major cities) or write directly to us.

*Registered trade names of The International Nickel Company. †Registered trade names of Haynes Stellite Company

Powell . . . world's largest family of valves

THE WM. POWELL COMPANY • DEPENDABLE VALVES SINCE 1846 • CINCINNATI 22, OHIO

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New efficiency means you can now handle many mixing jobs with a smaller model drawing less power.
New shock-protected internal gear turns the mixer shaft at a slower, more powerful 350 rpm.
New super-pitch prop delivers up to 45% more fluid flow than previous LIGHTNIN gear-drive models . . . higher impeller head in direct-drive models.
ANNOUNCING

a new level of competence in the mixing of fluids

You get more work out of these all-new LIGHTNIN propeller-type mixers.

They'll handle bigger batches, heavier materials, or do the job faster —*without using more power.*

Often a smaller, lower-cost model will do the job you want done—*on less power than you've been using.* That's how efficient they are.

In normal use, you won't have to lubricate these mixers for five years. Overloads can't hurt the gear drive. The chemical plant motor is standard, at no extra cost.

Notice how we've moved the lower shaft bearing and chuck up out of the mixer base, away from the splash of tank contents. And you don't need three hands to change the shaft. New quick-acting chuck locks it tight when you turn one screw.

They're ready in eight sizes from ¼ to 3 hp, gear drive or direct drive. Ask your LIGHTNIN Mixer representative for details. His name is in Thomas' Register and in the yellow pages of your telephone directory. Or write us for descriptive Bulletin B-521.

FOR CLOSED TANKS. Same all-new design, with new stuffing box or rotary mechanical seal. Also described in Bulletin B-521.

PORTABLES, TOO. New indexing feature makes it a snap to set mixer at the correct angle. Nine sizes, ⅛ to 3 hp. Request Bulletin B-520.

Lightnin® Mixers

MIXCO fluid mixing specialists

MIXING EQUIPMENT Co., Inc., 132-n Mt. Read Blvd., Rochester 3, N.Y.

In Canada: Greey Mixing Equipment, Ltd., 100 Miranda Avenue, Toronto 19, Ont.

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makes the film effective in reducing corrosion due to electrolysis in salt and high mineral content waters.

One pound will treat 100 to 2000 gallons of water effectively. The chemicals are nontoxic, odorless and harmless to skin and clothing.

Supplier: Calgon Co., Div. of Hagan Chemicals and Controls, P.O. Box 1346, Hagan Center, Pittsburgh 30, Pa.

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Belt lacing equipment

Latest belt lacing equipment and materials are described and illustrated in Folder No. 100, issued by the Clipper Belt Lacer Co. Pocket-size folder contains descriptions and prices for the various belt hooks, lacers and cutters manufactured.

Information on new special-purpose belt hooks of stainless steel, rust-proof (monel) and phosphor bronze is included. Actual sizes and uses of all hooks are shown.

Each lacer model available, from the rugged speed lacer to portable lacers is also shown. Information on both the six- and ten-inch belt cutters is included.

7136 on Reader Service Slip.

VOTE FOR YOUR FAVORITE CARTOON

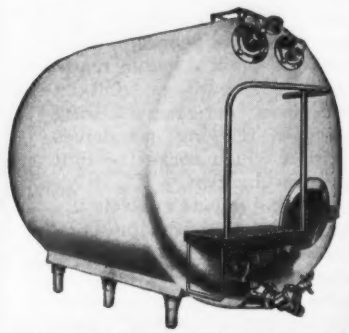
See this month's "FP Hall of Fame Cartoon" on page 109, and then vote for large reproduction of your favorite on the Reader Service Slip.

WALKER

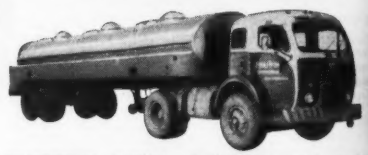
STORAGE *and* TRANSPORT EQUIPMENT

Wherever storage and transport of food products is required, Walker can supply the unit that will give you dependable economical performance.

We will gladly supply you with complete data and prices on the equipment you need.



STORAGE TANKS, Round, Oval and Rectangular. All sizes Standard or Cold Wall surface.



TRANSPORT TANKS. Trailerized and truck mounted. One, two or three compartments.

Stainless Steel Vertical Holding and Surge Tanks

Write today for literature on our complete line of stainless steel and fibre-glass equipment for the food industry.

WALKER

WALKER STAINLESS EQUIPMENT CO.
Dept. 45, New Lisbon, Wisconsin

7137 on Reader Service Slip.

For more information on ad at right, circle 7138

for the finest

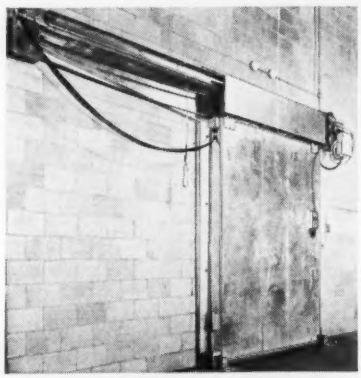
CORN SYRUP
AND
CORN STARCH

Penick & Ford

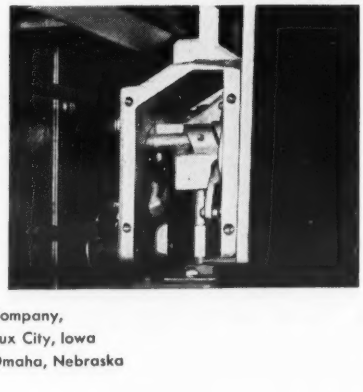
PENICK & FORD, LTD.
INCORPORATED

750 THIRD AVENUE, NEW YORK 17, N.Y.; 1531 MARIETTA BLVD., ATLANTA, GA.;
CEDAR RAPIDS, IOWA; 18 CALIFORNIA ST., SAN FRANCISCO 11, CALIF.

You can rely on our Technical Service Representatives for help on any production problem.



FAST OPERATION of Electroglide Freezer Door saves refrigeration. Note Jamison Frostop® installed to prevent icing and freezing.



POSITIVE SEAL. When door reaches closed position, exclusive Jamison camming action forces door *in* and *down*.

Photos Courtesy: National Tea Company,
Council Oak Stores, Sioux City, Iowa
Insulator: Low Temp Insulations, Omaha, Nebraska

In-and-out freezer room traffic speeded up by Jamison Electroglide® Doors

The efficiency and economy of Jamison's new Electroglide Power Operated Door are assured by special Electroglide features—available in no other door.

RANGE OF TYPES—Available as bi-parting and single leaf right or left hand.

LEVEL RIDE—Door opens and closes without gasket drag or wear.

SAFETY—Full height safety edge reverses door instantly on contact.

EMERGENCY CONTROLS—Manual operation when power off; emergency release from inside when padlocked outside.

Get the complete story on Electroglide Cooler and Freezer Doors. Write today for new bulletin to Jamison Cold Storage Door Co., Hagerstown, Md.

JAMISON
COLD STORAGE DOORS

7139 on Reader Service Slip.

Handling industrial water problems

A 24-page brochure, describing the role of industrial water consulting service, has been issued by Hall Laboratories, Div. of Hagan Chemicals & Controls, Inc.

Booklet discusses the whole range of industrial water problems from pre-treatment to waste disposal. It highlights the necessity for proper water management to obtain lower water costs.

Illustrated throughout, the booklet is set up as a simulated interview between a typical plant manager and a Hall engineer. In this way, questions such as the following are answered:

Why is water my most important raw material?

Why can't I solve my own water problems?

How much does consultation service cost?

Many examples of lower water costs are cited in the booklet, as well as case history examples describing process improvements that resulted from more efficient use of industrial water.

7140 on Reader Service Slip.

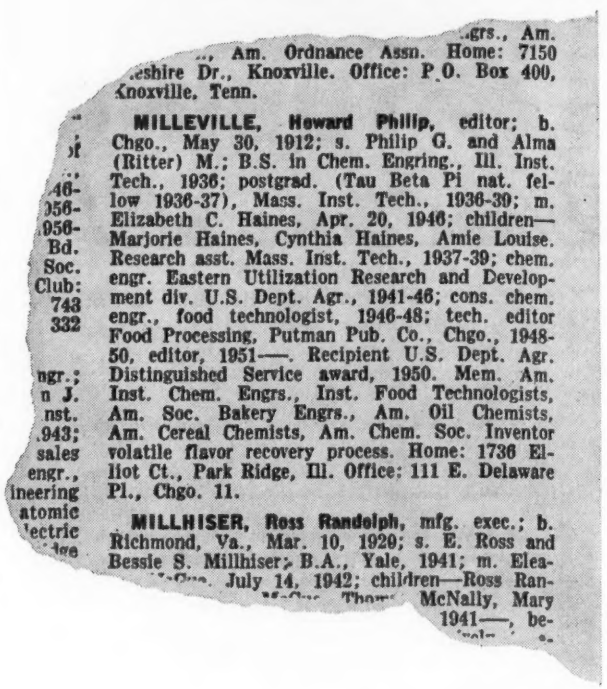
Grinds waste and flushes it out

Uses: To dispose of food waste by grinding in a stream of water. Handles practically any food waste except banana stalks and corn husks.

Features-description: Disposed materials fall into a hopper and are power fed from the hopper to the grinding chamber where it is pulverized and mixed with water. Unit disposes of waste immediately by washing it into the sewer. Light metal objects such as small nails and wire are caught in a metal trap.

Parts are easily accessible for routine maintenance and repair care. Units are manufactured in several sizes and capacities ranging from 40 bushel to 200 bushel per hour. Motors required range from 2 to 20 hp depending upon the

This is what "Who's Who in Commerce and Industry" has to say about



...grs., Am. ..., Am. Ordnance Assn. Home: 7150 ...eshire Dr., Knoxville. Office: P. O. Box 400, Knoxville, Tenn.

MILLEVILLE, Howard Philip, editor; b. Chgo., May 30, 1912; s. Philip G. and Alma (Ritter) M.; B.S. in Chem. Engring., Ill. Inst. Tech., 1936; postgrad. (Tau Beta Pi nat. fellow 1936-37), Mass. Inst. Tech., 1936-39; m. Elizabeth C. Haines, Apr. 20, 1946; children—Marjorie Haines, Cynthia Haines, Amie Louise. Research asst. Mass. Inst. Tech., 1937-39; chem. engr. Eastern Utilization Research and Development div. U.S. Dept. Agr., 1941-46; cons. chem. engr., food technologist, 1946-48; tech. editor Food Processing, Putman Pub. Co., Chgo., 1948-50, editor, 1951—. Recipient U.S. Dept. Agr. Distinguished Service award, 1950. Mem. Am. Inst. Chem. Engrs., Inst. Food Technologists, Am. Soc. Bakery Engrs., Am. Oil Chemists, Am. Cereal Chemists, Am. Chem. Soc. Inventor volatile flavor recovery process. Home: 1736 Elliot Ct., Park Ridge, Ill. Office: 111 E. Delaware Pl., Chgo. 11.

MILLHISER, Ross Randolph, mfg. exec.; b. Richmond, Va., Mar. 10, 1920; s. E. Ross and Bessie S. Millhiser; B.A., Yale, 1941; m. Elea... July 14, 1942; children—Ross Ran... McNally, Mary ... 1941—, be...

HOWARD P. MILLEVILLE
Editor of FOOD PROCESSING

This is a record of experience . . . *practical experience* . . . the kind of experience that goes into reporting and interpreting every bit of information that appears in every issue of FOOD PROCESSING.

That's why FOOD PROCESSING—the Magazine of Applied Technology for Men Who Manage—is today the No. 1 publication in its field.

FOOD PROCESSING

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CHEMICAL PROCESSING • FOOD PROCESSING • FOOD BUSINESS
WHAT'S NEW IN PLANT-ENGINEERING EQUIPMENT
QUEST . . . for tomorrow

Which of these features do you look for in a FOOD OR BEVERAGE HOSE?

Freedom from Odors and Taste?
Ease of Cleaning and Sterilizing?
Transparency?
Flexibility?
Long Service Life?
Wide Range of Standard Sizes?

TYGON® plastic TUBING B44-3 *combines them all!*

Remaining flexible throughout the full range of normal operating temperatures, Tygon plastic Tubing, Formulation B44-3, is also as clear as glass, permitting visual inspection and control of flow.

Non-contaminating and non-toxic, Tygon Tubing B44-3 neither imparts nor absorbs taste or odors, is safe with even the most flavor-sensitive products.* Because of its smooth, hard bore, Tygon Tubing is easily cleaned, can be sterilized with steam (open end method) or bactericides.

Tygon Tubing is non-aging, highly resistant to abrasion, and has a flex life 10 to 12 times greater than rubber. More than 65 standard sizes, up to 4" I.D., are available in continuous lengths.

*For processed milk and milk products, use Formulation B44-4X.

See why Tygon Tubing, Formulation B44-3, is almost universally the preferred plastic for handling foods and beverages. Get complete information — write today for your free copy of Bulletin T-100.

443-F-3

PLASTICS & SYNTHETICS DIVISION

U. S. STONEWARE
AKRON 9, OHIO

TYGON is a registered Trade Mark of The U. S. Stoneware Co.

7142 on Reader Service Slip.

rated capacity of the unit.

There are two standard units with the same dimensions. These are enclosed in a metal cabinet. Tops are stainless steel and sides are removable for access to the unit. The cabinets measure 50 inches long, 23 inches wide and 36 inches high.

Dimensions of the larger units range up to 80 inches long, 66 inches wide and 45 inches high. These are not equipped with cabinets.

Supplier: Buffalo Hammer Mill Corp., 1247 McKinley Parkway, Buffalo 18, N. Y.

7143 on Reader Service Slip.

Describes fly control and precautions for applying residual insecticides

Two sanitation bulletins have been issued by the Department of Bakery Sanitation of the American Institute of Baking.

The first bulletin, #97, is on "Flies and Their Control". This 5-page bulletin provides general information on flies, their habits and characteristics and illustrates the life cycle of the fly as well as showing several different types of flies.

In considering fly control, bulletin #97 discusses good sanitation, mechanical barriers, chemical control, poison baits, vaporizers and electrical methods.

The second bulletin, #98, is on "Precautionary Rules for Applying Residual Deposits". Eleven such methods of preparation are listed in this 1-page bulletin.

7144 on Reader Service Slip.

V-belt has 6 times torque in 1/3 less space

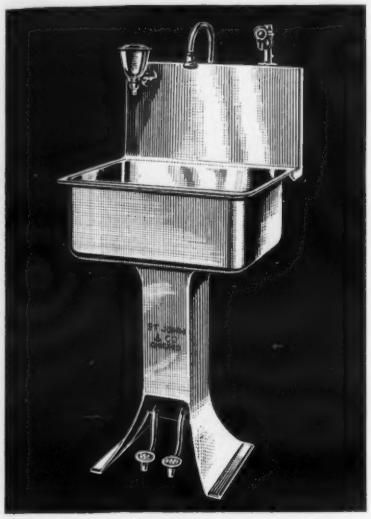
Roto-mission is a V-belt drive with differential planetary gear transmission in the driven pulley. Pinion gears inside the pulley (transmission) reduce the RPM's and transmit the driving force to the driven shaft.

Three basic methods of con-

SANITARY!

STAINLESS STEEL LAVATORY

by St. John



Designed for use wherever sanitation requirements are exceedingly high, this low-cost St. John lavatory is a remarkable achievement in every detail.

Originally intended for use in packing-houses where it meets and surpasses all requirements for federally-inspected plants, it has found wide application throughout the food industry because of its smart appearance, functional design and many practical features.

For example:

- **Extra Deep Bowl** — with smoothly rounded inside corners. Deep-drawn of type 302 stainless steel, seamless and handsomely polished.
- **Splashback** — drains into the bowl. Made of smooth, seamless stainless steel.
- **Unbreakable Soap Dispenser**—chrome plated, permanently fastened to splashback. Suitable for liquid or powdered soap.
- **Spray**—chrome plated, with aerating nozzle.
- **Foot Operated Valve**—hot and cold water separately controlled or mixed.
- **Pedestal**—heavy cast aluminum alloy, resistant to virtually all acids and alkalis.
- **Simple Installations**—attach to water lines and drain. Spray is piped from foot valve at factory.

Write for full details and the complete St. John catalog.

"Famous for Stainless"

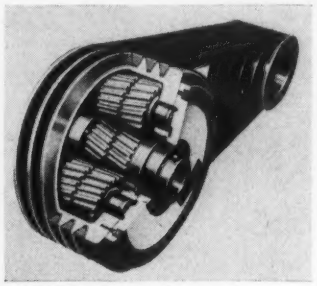
ST. JOHN & CO.

5800 S. Damen Avenue • Chicago 36, Illinois
Phone: PRospect 8-4200

7145 on Reader Service Slip.

trol are 1- driving action can be engaged, disengaged or reversed through mechanical, electrical, pneumatic or hydraulic means. 2- Load limiting or releasing and overload alarm can be provided by various systems. 3- Dual speed operation can be provided by various clutching methods.

The unit is available with as many as 12 pinion assem-



Cutaway of driven pulley

blies with torque ratings as high as 21,850 pound-feet. Horsepower ratings range from fractional sizes to 60 HP and reduction ratios up to 270-1.

Supplier: Airborne Accessories Corporation, Industrial Division, 1414 Chestnut Ave., Hillside 5, N.J.

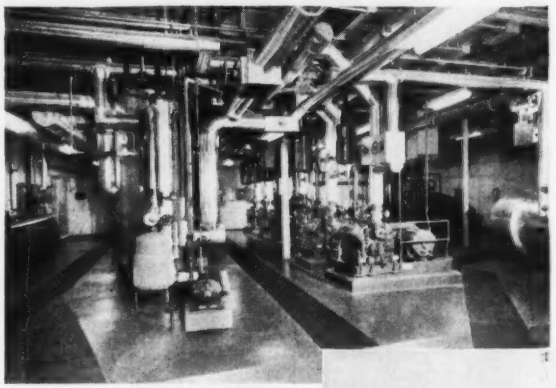
7146 on Reader Service Slip.

"I'll pay you double time if you'll hold that over the weekend."

Borden's New "Dairyland Showcase" plant relies on an all-Vilter Refrigeration System

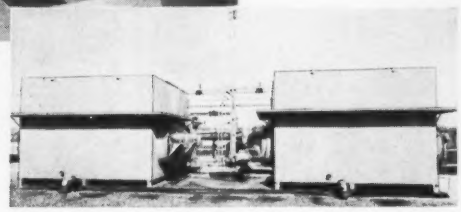
Borden's

With 110,000 square feet of floor space, Borden's new $3,000,000 Milwaukee milk and ice cream plant is one of the most up-to-date and modern dairies ever built.



Overall view of compressor room showing the six Vilter ammonia high-stage VMC compressors, Vilter brine cooler and liquid receiver. Five rotary booster compressors are installed in a line behind the intercooler.

View of the two Vilter VP350 evaporative condensers which handle the discharge from the compressors. A center partition in each unit provides an efficient means of reducing capacity and maintaining desired head pressure during cold weather.



500,000 quarts of milk a day! 5,000,000 gallons of ice cream a year!

These are the very imposing capacities of Borden's new Milwaukee milk and ice cream plant—the largest in Wisconsin.

An extensive all-Vilter system provides the refrigeration for the varied requirements of this plant. *Four* separate methods of refrigeration are employed—direct expansion, liquid recirculation, flooded and brine.

Borden's compressor room contains six Vilter ammonia VMC compressors and five boosters. A 42" x 10' Vilter intercooler is installed between the two stages. Handling the discharge are two Vilter VP350 evaporative condensers.

Each day the largest sweetwater tank installed in the state of Wisconsin chills 670,000 gallons of water to 33° which, in turn, holds the pasteurized milk storage tanks at 38°. Fifteen air units provide the refrigeration for the milk cooler, and forty-four truck charging positions accommodate the milk delivery fleet.

Other major Vilter equipment includes a hot gas defrost blast freezer for Borden's mammoth ice cream hardening room and a brine cooler for ice cream bar freezing.

All equipment selected by Borden was chosen to perform its job efficiently, quickly and insure the most sanitary, pure and wholesome products. Vilter is proud to play a part in this, Borden's "Dairyland Showcase."

Why not check with Vilter on your refrigeration problems?

Vilter® refrigeration air conditioning

The Vilter Manufacturing Company
Milwaukee 7, Wisconsin

Air Units • Ammonia and Freon Compressors • Booster Compressors Baudelot Coolers • Water and Brine Coolers • Blast Freezers Evaporative and Shell and Tube Condensers • Pipe Coils Valves and Fittings • Pakice and Polarflake Ice machines.

Write for your copy of bulletins covering above equipment to The Vilter Manufacturing Company, Dept. D-603 2217 South First Street Milwaukee 7, Wisconsin.

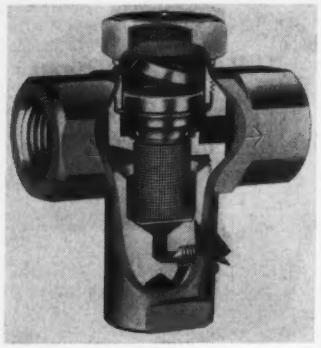
7147 on Reader Service Slip.

Steam trap combines blowdown, strainer

Combining three operations, blowdown, strainer and steam trap in one unit offers savings in installation time and fittings.

Yarway No. 130, employs a thermodynamic principle in trapping steam. The same unit contains a dirt and sludge strainer thereby eliminating need for a separate strainer.

Sludge and dirt accumulate below the thermal valve and



Allen set screw (arrow) serves as blowdown valve

is blown out when the set screw is loosened. Blowdown outlet is threaded so that a pipe may be attached if desired.

The trap is designed for light condensate loads and furnished in ½ inch pipe size.

Supplier: Yarnall-Waring Co., Philadelphia, Pa.

7148 on Reader Service Slip.

Forms sure seal between stationary line and revolving equipment

A revolving connection that forms a positive seal between a stationary supply line and revolving equipment is described and illustrated in 20-page Bul No. 700, issued by Perfecting Service Company.

The rotary unions are made in two types. Type "P" is a single inlet unit designed to convey liquids or gases into or out of revolving machines, rolls or drums.

Type "S" (syphon) has

DOW | INSULATION

James S. Hutchison, chief engineer for Lemon Products Division, Sunkist Growers, who utilized nearly 400,000 board-feet of Styrofoam in a new warehouse at Corona, California.

STYROFOAM®

Approved Insulation Contractor relieves Sunkist of detail on low-temp installation for new warehouse

"Styrofoam*, installed by a Dow Approved Insulation Contractor," reports James S. Hutchison, chief engineer for the Lemon Products Division, Sunkist Growers, "gives us the advantages of a permanent, moisture-sealed, maintenance-free insulation job." The AIC, Los Angeles Cork Company, installed nearly 400,000 board-feet of Styrofoam in a new warehouse that's so large it can hold enough frozen concentrate to make a four-ounce glass of lemonade for every U.S. citizen.

"Having an AIC do the job meant that we didn't have to spend expensive engineering time to 'nursemaid' the project," Mr. Hutchison points out. "Then too, the inspectors which Dow provided undoubtedly were much more familiar with this type of construction than we. In short, we were relieved of maintaining a time-consuming, laborious inspection program, without risking any defects in workmanship."

As Sunkist found out from first-hand testing, neither water nor water vapor penetrates Styrofoam, which makes its high insulating efficiency (low "K" factor) *permanent*. "Competitive insulating materials were checked for their resistance to vapor passage," Mr. Hutchison reports. "We couldn't even get a pressure drop through the Styrofoam."

As Sunkist discovered by careful investigation of insulation materials and contractors, the AIC certificate is awarded by Dow only to carefully selected contractors capable of providing technical design assistance, followed by expert installation. Los Angeles Cork Company is typical of more than 90 Approved Insulation Contractors located throughout the country. For the names of the ones nearest you, write THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Department 1642BH12.

*Dow's registered trademark for its expanded polystyrene

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

7149 on Reader Service Slip.

dual pipe connections where both supply and return of gases or liquids are required within the same unit.

Positive sealing principle uses a monel bellows, keeping the sealing surfaces parallel and leak-proof. Mechanical seal is so designed that it automatically adjusts to the actual pressure of the media being transferred.

Ball bearing construction and self-aligning reduces strain and wear on the seal, assuring long, trouble-free service.

Rotary union handles steam, water, air, vacuum, gases and industrial fluids on applications up to 250 psi and 150 psi steam, temperatures up to 500 F without adjustments.

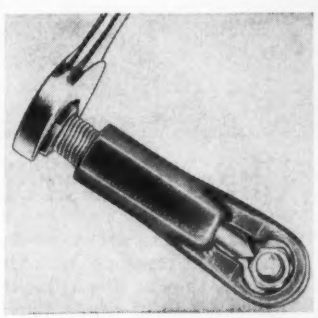
It is available in sizes ¼" through 3" with right or left hand threads. Machine threads are furnished for speeds over 600 rpm.

7150 on Reader Service Slip.

Removes frozen nuts without damage to threads on bolts

Cutting tool is designed to split and remove nuts without damage to bolt.

Known as "Nut Buster", unit will split over 100 nuts



Turning hex head drives the cutter into a nut

without need to sharpen the cutting edge. Standard size with ¾ inch opening. Also available in large size with a 1-3/16 inch opening.

Supplier: Burroughs Tool and Equipment Corp., 2429 Burdick St., Kalamazoo, Mich.

7151 on Reader Service Slip.

Cherry-Burrell Knocks the Wind out of Peanut Butter

It's a peanut's lot to be crushed, cracked, crumpled and thrown at umpires. But after they're made into peanut butter, they're given the treatment of their lives to remove air from the product. Any air that's left affects flavor and short-fills jars. One Eastern processor needed a more effective method of deaerating peanut butter. He asked Cherry-Burrell to solve the problem.*

Cherry-Burrell engineers studied the situation and recommended a modified vacuum-pressure Round Processor. A special disperser injects a thin film of peanut butter into the processor, exposing trapped air to the vacuum. Specially designed agitators promote faster heat transfer and float trapped air to the surface. Unique surface breakers allow air to escape and to be removed by the vacuum. Now the manufacturer's peanut butter stays flavorful in the jar, and each jar is filled full every time.

Highly trained technicians will test your product without obligation in a Cherry-Burrell laboratory. They will show you how Cherry-Burrell food processing equipment can help you improve your operation and profit position. Your specialists are invited to participate in the testing. Call or write Cherry-Burrell today.

* *Case history on request.*

EQUIPMENT FOR HOMOGENIZING, HEATING, COOLING, FLAVORIZING, STORING, SEPARATING, FREEZING, MIXING, PACKAGING AND CONVEYING. WRITE FOR YOUR FREE CATALOG.

CHERRY-BURRELL CORPORATION
CEDAR RAPIDS, IOWA

Association News

Charles F. Spencer Award

for outstanding achievement in the field of agriculture and food chemistry was presented on November 18 to Dr. C. H. Bailey at the annual Fall Chemical Conference, sponsored

by the Kansas City Section of ACS.

One of the nation's top cereal chemists, and Dean Emeritus of University of Minnesota's Institute of Agriculture, Dr. Bailey pioneered application of advanced techniques of physical and biological chemistry to food problems, and has had great influence in establishing cereal processing on a scientific basis.

American Institute of Chemists

1960 Honor Scroll has been awarded to Dr. Roger W. Truesdail, founder and president of Truesdail Laboratories, Inc., "for meritorious services to the profession of chemistry."

National Pickle Packers Assn.

has re-elected as president L. Evert Landoo, Nalley's, Inc., Tacoma.

National Confectioners Assn.

Chicago, has named as chairman of its Sanitation Committee Robert E. Picken, president of Peerless Confection Co., Chicago. The committee works to maintain high standards of plant cleanliness in the confectionery industry, through regional "Sanitation Seminars" and similar activities.

For more information on product at left, circle 7452 see information request blank opposite last page.

Richard Henszey, inventor of the DR Evaporator, is shown with his small pilot-plant model at the Dairy Show

- NO STEAM
- NO WATER
- NO REFRIGERATION

SHOWN AT DAIRY SHOW —

Vacuum evaporator with efficiency of 10 effects

HOWARD P. MILLEVILLE
Editor

A REVOLUTIONARY TYPE of evaporator was introduced at the Dairy Show last month by the Henszey Company.

Its principle of operation — mechanical compression of the vapors — is not new. What is new is the application of this principle to processing of milk in this instance, and in the future to other heat-sensitive liquids. Heretofore, this type of evaporator has been applied primarily to obtaining fresh water from sea water.

The only power required to run the evaporator is energy to run the compressor. Ordinarily, this will be electrical, but it could be supplied by a diesel or by an engine operating on natural gas.

No condenser water is required; a small amount of sealing water is required for the condensate removal pump, but would not exceed about 1 gallon per minute even for a large installation.

In this new DR Evaporator* the steam evaporated from the milk is compressed mechanically by a standard Roots-Connerville positive displacement blower to a higher pressure and temperature, then introduced into the steam chest, where it becomes the heating medium.

For example,** consider a DR Evaporator operating at 3 psi absolute pressure (23.8 inches Hg vacuum, 141.5 F) with an overall temperature difference in the calandria of 16 F.

To obtain these conditions, the vapors would be compressed from 3.0 psi absolute pressure to 4.5 psi absolute pressure.

At 4.5 psi the saturation temperature is 157.8. Hence, the overall temperature difference — condensing steam to evaporating liquid — is 16.3 F.

Assuming the compressor operates at

*DR stands for Dynamic Recompression and serves to differentiate the evaporator from the usual less efficient thermo-recompression type.

**The example is a theoretical one computed by the editor, based on saturated steam to the compressor and adiabatic compression.

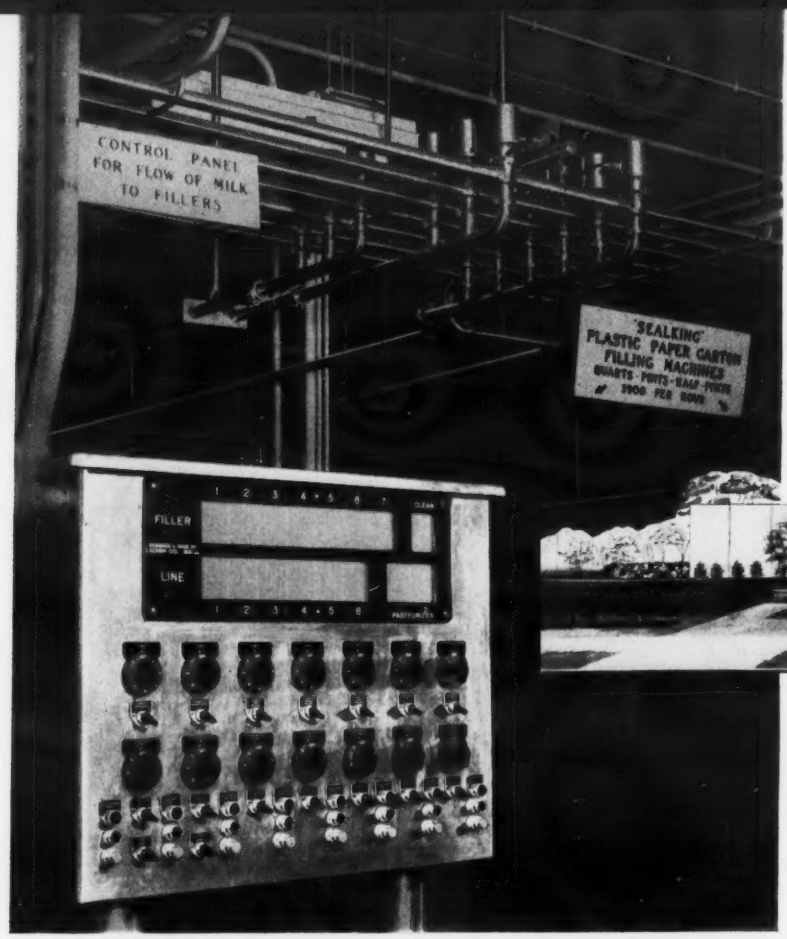
BUFLOVAK
DRUM DRYERS

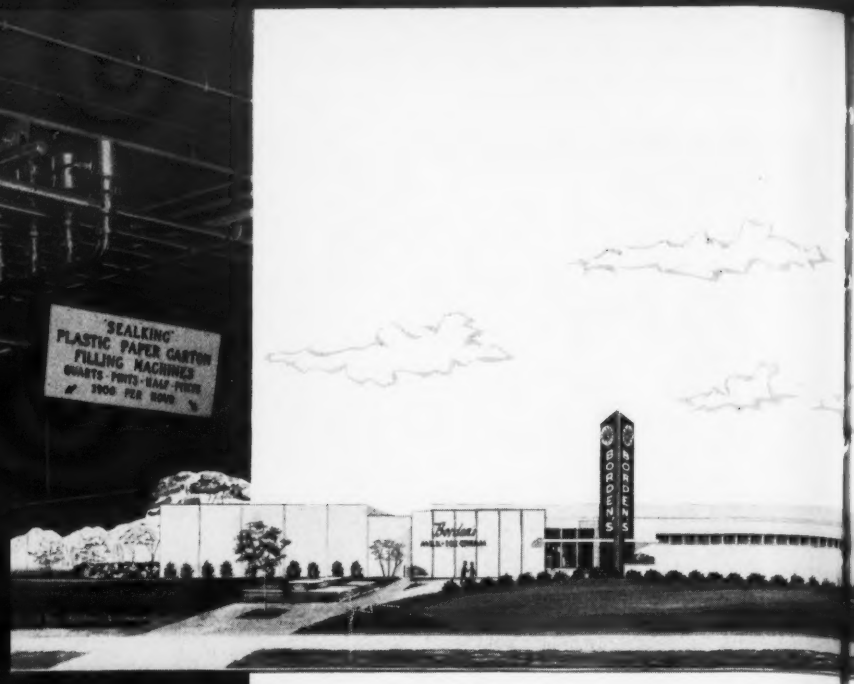
for cereals, syrup, vegetables, starch, yeast, baby foods, extracts, waste

Whatever your material in process may be, Buflovak Equipment will provide the way to the most profitable operation. ■ Vacuum or atmospheric, single or double drum, Buflovak can job-tailor the dryer for your product. ■ For details, write for Catalog 384, Buflovak Equipment Division, 1559 Fillmore Ave., Buffalo 11, New York.

Buflovak Equipment Division
BLAW-KNOX

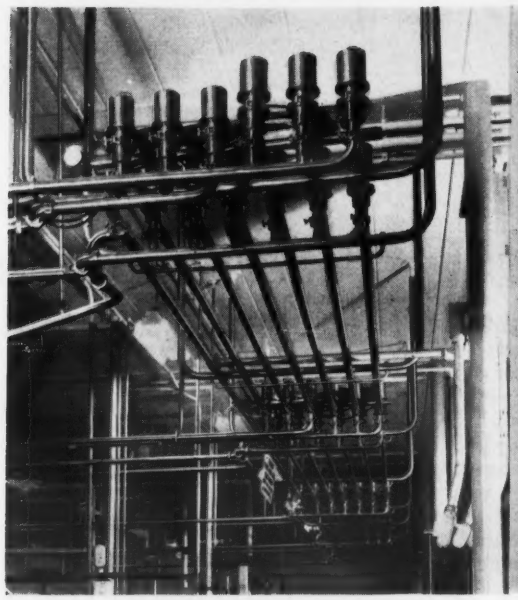
7153 on Reader Service Slip.



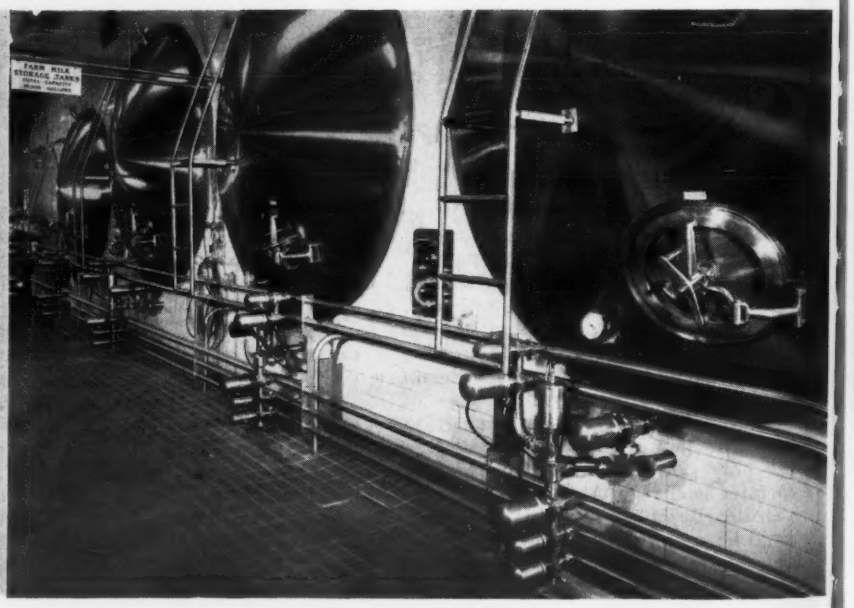


The control center at left automatically controls the flow of milk to fillers. Panel has a projection type digital display unit which shows at a glance exact status of filling operation.

The control panels, air-actuated valves, and valve manifolds are products of Ladish Co. Fesco Division, specialists in the design of automatic control systems . . . and in the installation of air-actuated valves and controls used in these systems.



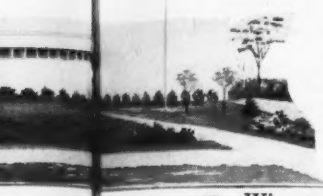
"Fesco" air-actuated valves are the "heart" of the automatic processing operations. There are 152 of these efficient automatic valves installed in this plant for accurate control of liquid flow.



View showing a group of stainless steel farm milk storage tanks, having a combined capacity of 70,000 gallons. Filling operations, distribution of milk to pasteurizer, and CIP cleaning operations are controlled through seven "Fesco" valves connected to each of these tanks.

TRI-CLOVER EQUIPMENT

helps Borden's "Dream Plant" achieve new standards in Automatic Processing



INSTALLATION "HIGHLIGHTS"

- **110,000 square feet of floor space**
- **Raw milk storage capacity, 70,000 gallons**
- **Can pasteurize, homogenize and cool 35,000 quarts per hour**
- **Capacity to process a half-million quarts of milk per day**
- **Control system utilizes over 30,000 feet of electrical wire**
- **Process lines inter-connected by almost 7,000 feet of stainless steel tubing**
- **Automatic flow control handled through 152 air-actuated valves**

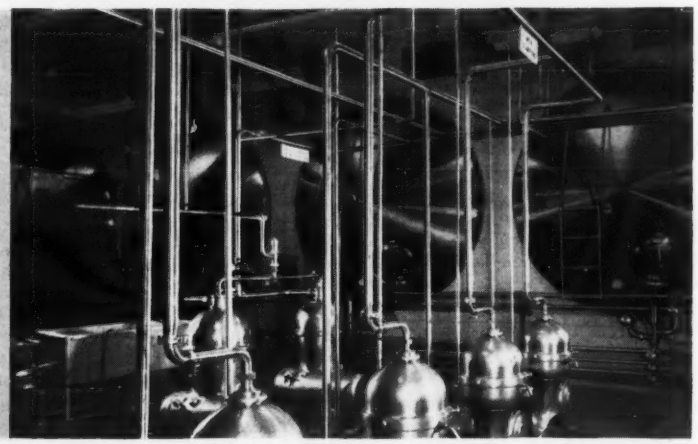
Wisconsin's largest, most modern milk and ice cream plant . . . Borden's *"Dairyland Showcase"* . . . is now in operation. With its processing capacity of 500,000 quarts of milk per day, this amazing plant could supply a pint of milk daily to every family in Wisconsin. It will be able also to produce five million gallons of famous Borden's ice cream per year.

Ladish Co. is proud of the important part played by its Tri-Clover and Fesco Divisions in helping The Borden Co. achieve new standards of efficiency in the modern, automatic processing operations of this Wisconsin "Dream Plant".

The equipment, some of which is illustrated on these pages, was designed, manufactured and installed by Ladish Co. Tri-Clover and Fesco Divisions and includes 152 *"FESCO"* air-actuated valves . . . several modern, practical control panels . . . hundreds of "Tri-Weld" stainless steel welding fittings, welded in place with a "Tri-Welder" automatic welding machine right in the plant . . . numerous Tri-Clover sanitary centrifugal pumps . . . special pipe hangers and supports . . . as well as almost 7,000 feet of stainless steel tubing "Tri-Welded" on the job.

This "Showcase" Plant serves as a most striking example of the way in which the combined engineering ability, design and manufacturing skill of these Ladish Co. Divisions has helped to lead the way to modern automated dairy plant operation. Let this wealth of experience serve you in your next expansion program.

Valve manifold used for filling pasteurizer storage tanks and for transferring milk from these tanks to the filling machines. Also, note the simple, clean and effective method of mounting one of the many Tri-Clover pumps to permit fast, easy removal of the unit from the lines for inspection and maintenance.



"Tri-Weld" stainless steel butt weld fittings are employed extensively throughout this efficient Borden "Showcase" installation. The "Tri-Weld" lines installed above these clarifiers and separators were quickly and economically fabricated right on the job with Tri-Clover's new portable welding machine . . . The "Tri-Welder".

See your nearest Tri-Clover Distributor.

IN CANADA: Brantford, Ontario
EXPORT DEPT.: 8 South Michigan Ave., Chicago 3, U.S.A.

TRI-CLOVER

LADISH CO.
Tri-Clover Division
Kenosha Wisconsin

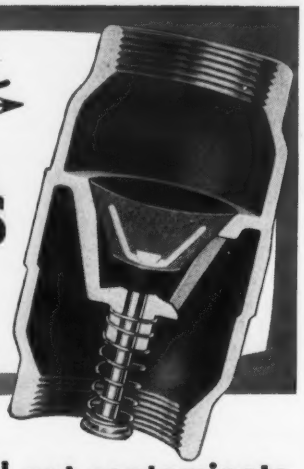
S-560

7154 on Reader Service Slip.

Strataflo

CHECK VALVES

for semi-solid and liquid food handling equipment



New valve resists acids, will not contaminate

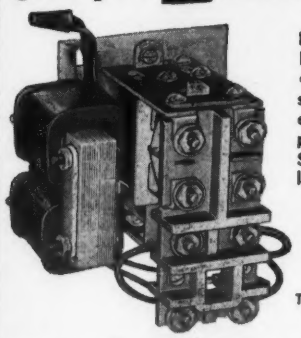
The new No. 3300 Strataflo Check Valve is designed to eliminate many of the problems encountered in semi-solid and liquid food handling equipment. Acid cannot harm the rugged one-piece body which is cast of a high nickel alloy. A large port area and unique straight line flow give greater capacity with low restriction. There are no "pockets" to fill up and encourage contamination. Easily cleaned by back-flushing. Leak-proof Neoprene poppet is non-toxic, odorless and tasteless. Valve will operate in any position; 200 lbs. working pressure. Available in three sizes: ¾", 1" and 1¼". Write for Bulletin 208 for information and prices.

STRATAFLO PRODUCTS, INC.
FORT WAYNE, INDIANA

7155 on Reader Service Slip.

WARRICK
Floatless, Electrode Type
LIQUID LEVEL CONTROLS

give you all these advantages!



No moving parts in the liquid • Easy to install • No adjustments necessary • Unaffected by acids or caustics • Unaffected by pressure or temperature • Standard 2&3 pole units listed by U/L

Write for 32-page Catalog which gives complete specifications

Two pole control shown at left

YOU CAN USE OUR CONTROLS FOR:

- Single & multiple pumps
- Motor & solenoid valves
- High & low cutoffs & alarms
- Evaporators
- Pressure vessels
- Storage tanks
- Waste sumps

Special controls to custom requirements

CHARLES F. WARRICK CO.
1964 W. Eleven Mile Road, Berkley, Michigan
Dept. 15 Telephone JOrdan 4-6667

7156 on Reader Service Slip.

processing

80% efficiency, the energy requirements figure out to 1 KW per 100 lb of steam.

If power costs 0.9 a KW hr and steam costs 90 cents a lb, the heating cost is reduced to 1 tenth that of a single effect. At lower power costs, the savings are correspondingly greater.

This DR Evaporator has been thoroughly tested on a pilot-plant scale. In single-stage operation on milk, a 5 to 1 concentration to 45% solids is achieved. Once-through circulation reduces processing time to a minimum.

If a natural gas engine is used to drive the compressor, it will consume 9.6 cu ft of natural gas (1000 Btu/cu ft) to evaporate 100 lbs of water. Thus, an input of 9600 Btu's accommodates an evaporation load of 101,300 Btu's, reducing the fuel cost to less than one-tenth that of a single-effect steam evaporator.

When using a natural gas engine drive it is possible to use the hot exhaust gasses to supply the necessary heat without any additional cost to operate an absorption refrigeration system while the evaporator is in operation.

A commercial-size unit will soon be installed and performance on it will be reported in FOOD PROCESSING at a later date.

7157 on Reader Service Slip.

Uniform mixing by continuous systems

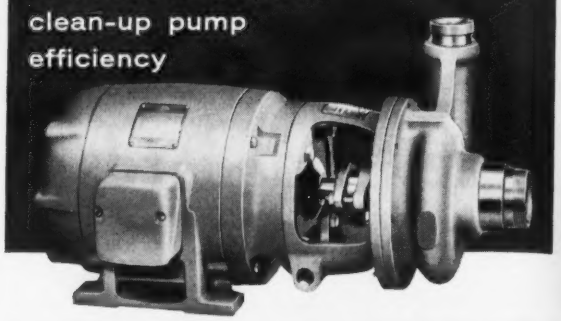
Single-unit controls for continuous, multiple mixing systems provide uniformity of product. Controls and systems, as well as sifters, feeders, net weighers, roller mills and packaging equipment are described and illustrated in 24-page catalog No. 806.

Released by B. F. Gump Co., literature is a condensed presentation of equipment available by this firm for processing dry powdered, granular, crystalline or flake materials. Specifications and engineering data are included with discussion of equipment.

7158 on Reader Service Slip.

try to match this ...for close-coupled clean-up pump efficiency

Ampco CIP Feed Pump furnished with your choice of sanitary fittings. Available with mechanical seals. Pedestal models also available.



You can't*... unless you already have an AMPCO® *Stainless Steel Pump

You get twice the output energy of sanitary pumps — double the efficiency! Ampco pumps are made for high heads and transfer service. They are quiet and vibration-free — and they won't overload.

Closed impeller contributes to high efficiency and long life, eliminates the need for shaft adjustment, permits close-coupled assembly. Casings and shafts are protected by replaceable wear rings and shaft sleeves.

Carried *in stock* in principal industrial areas. Capacities to 600 gpm., heads to 180 ft. Write for Bulletin P-3c.

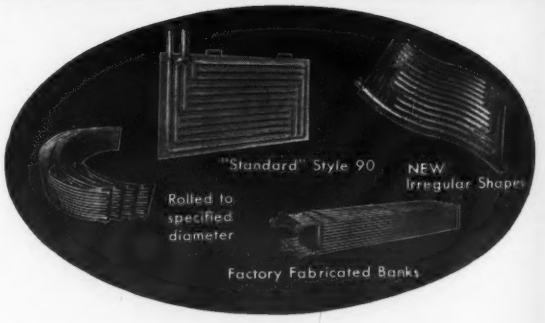
AMPCO
AMPCO METAL, INC.
® Dept. 229L, Milwaukee 1, Wis.
West Coast Div.: Huntington Park, Cal. • Southwest Div.: Garland (Dallas County), Tex.
P-49

7159 on Reader Service Slip.

PLATECOIL®

FOR ALL KINDS OF TANK AND PROCESS HEATING AND COOLING

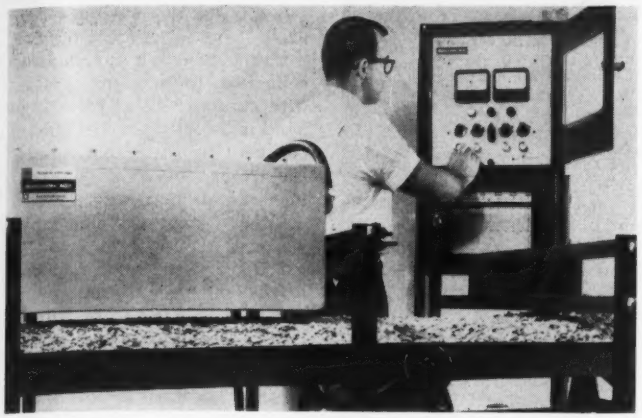
- Built to fit application requirements
- High heat transfer capacity
- Compact units save space
- Easy to install
- Easy to remove for cleaning
- Available in variety of weldable metals
- Operating Pressures up to 250 psig.

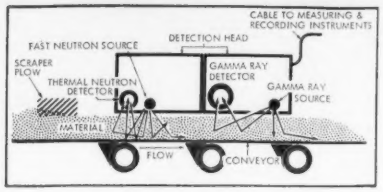


Send for Bulletin P53

PLATECOIL® DIVISION
TRANTER MANUFACTURING, Inc., LANSING 9, MICHIGAN

7160 on Reader Service Slip.





Measuring heads of moisture and density gages are similar in appearance and installation; are therefore frequently combined. Measuring head of moisture gage is located directly over moving material on belt conveyor. Scraper at right rough-levels material to provide air space between SS measuring-head bottom and bed of material.

To measure per cent moisture of solid materials on conveyor belt, gage has two-compartment head. Left section houses neutron source-detector assembly for determining moisture; right section houses gamma source-detector assembly. Latter is necessary to compensate for density changes that may take place.

When density measurement only is desired, gamma source-detector unit is used by itself

Apply nucleonics to . . .

Continuously measure moisture, density of granular solids in motion

- **better than ± 2 per cent installed accuracy**
- **no contact of materials on conveyors or in bins**

FP STAFF

TWO NEW instrument systems for use on processing streams make possible routine, automatic measurement and control of moisture and density of granular solids.

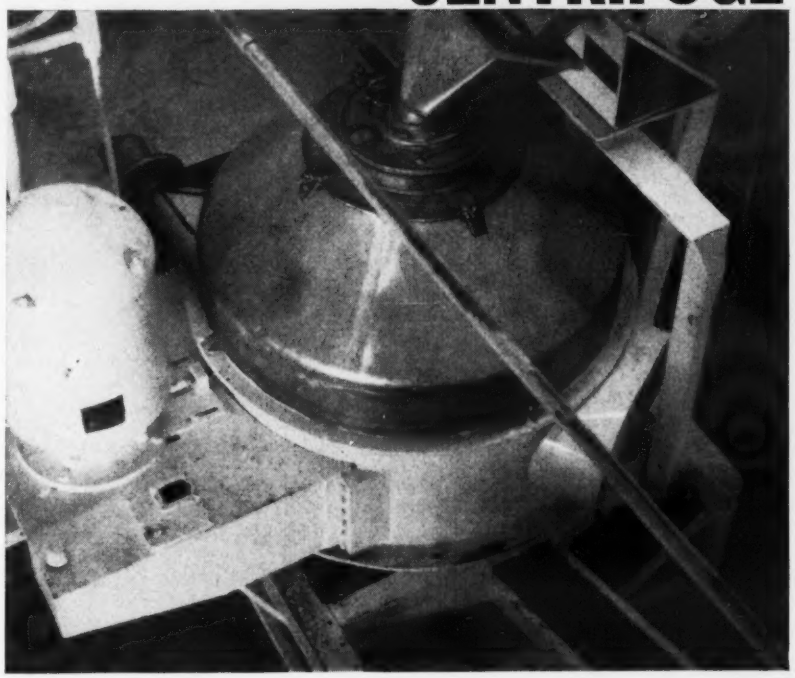
Using atomic-particle emission and reflection, both systems measure variables without actual physical contact. Instrument accuracy of both systems is better than ± 1 per cent and installed accuracy is better than ± 2 per cent.

Both systems, made by Nuclear-Chicago Corporation, 359 E. Howard Ave., Des Plaines, Ill., have three basic components: appropriate measuring head, electronic readout unit and recorder-controller.

Moisture gage. Qualicon Model 507, has range of 2 to 30 per cent by weight, depend-

Sebastopol Cooperative Cannery cuts processing time, scores new apple juice sales hit . . . with

MERCONE SCREENING CENTRIFUGE



Modernizing its processing system with Mercone® Screening Centrifuge and Oliver Precoat Filter has enabled the Sebastopol Cooperative Cannery of California to introduce a new, distinctively flavored apple juice. Trade-marked Apple Time, it is already a sales hit.

Key to this success is the continuous, automatic separation of pomace and juice from the pulverized apples made possible by the Mercone Screening Centrifuge. Subsequent filtering through an Oliver Vacuum Precoat Filter results in a clear, full-flavored juice, ready for pasteurization and canning. The new process eliminates the loss of volatile flavor involved in the old, time-consuming press and rack methods. Processing takes minutes from whole apples to canned juice. Problems of constantly cleaning racks and presses are also avoided, with a consequent saving of labor.

The Mercone Screening Centrifuge is a compact, completely enclosed, sanitary unit that is adaptable for juice extraction from a wide variety of fruit and vegetable pulps. For more information on its applicability to your particular problems, write to Dorr-Oliver Incorporated, Stamford, Connecticut.

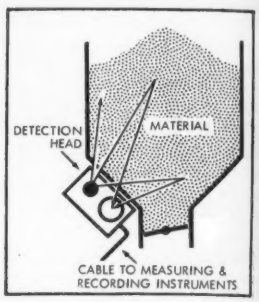
DORR-OLIVER
WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT

7161 on Reader Service Slip.

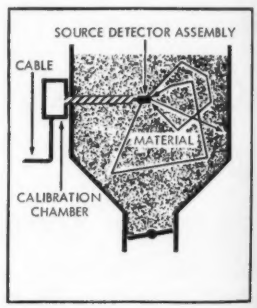
ing upon material being measured.

Using principle of neutron reflection to determine moisture content, signal from gage head is directly proportional to per cent moisture by volume. Electronic division is performed automatically to read out and display per cent moisture per unit weight.

Radiation source of moisture instrument is plutonium-beryllium or radium-beryllium. Alpha particles from either Pu



Density-gage measuring head can be installed as "blister" on side of hopper, tank or mixer, illustration above; cylindrical measuring head can be installed inside hopper, illustration below. Readings or control may be continuous or on demand



or Ra strike the beryllium thereby releasing fast neutrons into material being measured.

Some of these neutrons are reflected back, and since they have lost some of their energy to the material, are themselves at a lower energy level or slower speed. Reflected neutrons rebound to thermal neutron detector which will measure only the slow neutrons.

While all materials serve as neutron reflectors to some extent, hydrogen is by far the most efficient.

When most of the hydrogen in a system is associated with

Bravo ! It's under *Taylor* control

"It" is the DEMACO DiFrancisci Spaghetti dryer system at Alfonso Gioia and Sons, Inc., Rochester, N.Y., plant. Temperature and humidity are controlled by Taylor Instruments.

The drying time for spaghetti and macaroni products has been cut by more than 50% in recent years, thanks to the use of improved air circulation methods and precise regulation of temperature and humidity to prevent checking or color deterioration. Each of these Taylor control systems employs Wet Bulb and Dry Bulb SENSAIRE* Transmitters, a TRANSET* Computing Relay and a Pressure Regulator. The Dry Bulb Transmitter's signal actuates the Pressure Controller, which in turn regulates steam supply to control dryer temperature. Both Dry Bulb and Wet Bulb signals go to the Computing Relay, which operates a pressure switch controlling fan and louvers to maintain proper humidity.

Accuracy and dependability of the instruments is all-important in this system, since both wet and dry bulb temperatures have to be controlled within ± ½ degree F.

In addition to the very considerably reduced process time, Mr. Joseph Gioia, Vice President in charge of production, states that savings in floor space amount to approximately 60%; uniform quality is maintained automatically; spaghetti strands remain straighter; spoiled goods are unknown.

Whatever your processing control problem, remember that Taylor has had years of experience in serving the food industries. See your Taylor Field Engineer. Taylor Instrument Companies, Rochester, New York, and Toronto, Ontario.

*Trade-Mark

Taylor Instruments **MEAN ACCURACY FIRST**

7162 on Reader Service Slip.

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CESSING

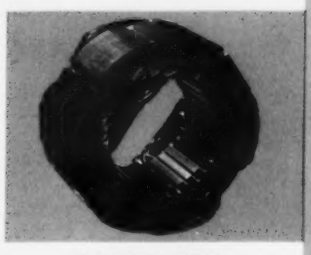
A NEW Duty Master FHP.

for heavy-duty industrial use

RELIANCE ELECTRIC AND ENGINEERING COMPANY

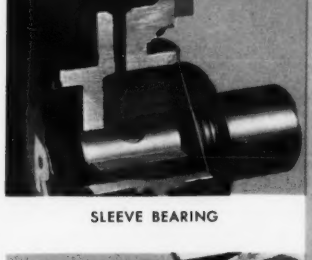
MASTER ELECTRIC COMPANY DIVISION

A NEW Duty Master FHP.

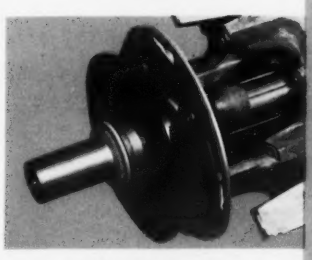


PROTECTED STATOR

TERMINAL BOARD



SLEEVE BEARING



CENTRIFUGAL CUT-OUT

TOUGH... COMPACT... COOL!

A motor that combines new, most-wanted features at no extra cost

Duty Master:

This motor is tough all over . . . deliberately designed for heavy industrial duty. Frame is rolled from steel—end shields cast from an aluminum alloy specifically selected for strength. Ball bearings are double-shielded, with lubricant packed into the bearing for life. Sleeve bearings are steel-backed and babbitt-lined for low friction and long wear. "Permawick" oil retaining material provides maximum lubrication to these bearings. Rotor is pressure-cast from high purity, low-resistance aluminum. Varnish impregnated stator resists moisture . . . and adds strength to windings.

Duty Master:

More power per pound . . . simple installation, 33% lighter than other preceding motor designs. Good design and materials make the difference. Makers of motor-driven products save on shipping and handling costs. Duty Master's light weight and small size make possible lighter, less complex mounting on equipment. Terminal board provides easy power connection in the front end shield. Cover plate quickly removable. Motor rotation easily reversed by interchanging slip-on connections.

Duty Master:

Up to 10% cooler than other comparably rated motors . . . yet gives you maximum protection. High load capacity results from new, effective ventilation of critical heat sources. Laminations, coils and rotor are literally rinsed with cooling air through new end shield design. In totally-enclosed, non-ventilated motors, the fan, cast integrally with rotor, circulates the air within the motor at a rate appropriate to efficient transfer of heat to motor frame and end shield. And load carrying capacity of the totally-enclosed fan-cooled motor is increased by a fan and shroud directing air over the frame and end shield.

Duty Master:

Quiet . . . Smooth . . . Positive. Resilient mounting composed of metal-rimmed, rubber-cushioning rings that encircle the bearing hubs on each end and support the motor. Motor can be mounted in any position. Single phase starter winding circuit automatically opens at 80% of full load speed. Action is quiet and positive.

Available now in 48 and 56 frame sizes, from conveniently located stocks. Duty Master FHP. is made in ⅛, ⅙, ¼, ⅓, ½ and ¾ hp. capacitor-start, split-phase and polyphase for 48 and 56 frames; repulsion-start induction-run in 56 frame. Your Reliance Sales Engineer or Distributor has all the facts at his finger tips. Call him or write for Bulletin B-2514. It will be sent to you promptly. B-2514

PRINTED IN U.S.A.

Product of the combined resources of Reliance Electric and Engineering Company and its Master and Reeves Divisions

RELIANCE ELECTRIC AND ENGINEERING CO.

CLEVELAND 17, OHIO

Canadian Division: Toronto, Ontario

Sales Offices and Distributors in principal cities

Duty Master A-c. Motors, Master Gearmotors, Reeves Drives, V★S Drives, Super 'T' D-c. Motors, Generators, Controls and Engineered Drive Systems.

water, neutron-reflection ratio becomes a specific measure of the percentage moisture in the material.

Density gage. Qualicon Model 502, has ranges of 30 to 65 lb/cuft and 65 to 150 lb/cuft.

Using gamma-ray reflection, gage has good stability. 24-hr zero shift is less than 0.1 per cent of full scale span, non-accumulative. Response time is 10 seconds.

Radiation source of density instrument is Radium or Cesium-137. Gamma rays from these sources behave very much like light rays in that some are absorbed, some are transmitted and some are reflected.

Percentage of rays transmitted is an inverse function of density; ratio of portion reflected to portion absorbed is also a function of the density.

For measuring density of unconfined materials such as solids on conveyor or in bin, gamma reflection method has been found most suitable; for measuring density of materials whose physical dimensions are well defined, as liquids in pipes, gamma transmission is best suited.

How a liquid-desity gage, using gamma-ray transmission, is used to control density of lemon juice is described in an article starting on page 29. Application of neutron-reflection in a fluid-moisture gage will be described in a future issue.

7163 on Reader Service Slip.

Checkweighing systems suited to specific needs

Checkweighing systems that can be applied to all types of dry or liquid, single- or multi-unit containers to provide continuous check on filling accuracy are covered in new four-pg Bulletin 50, of-

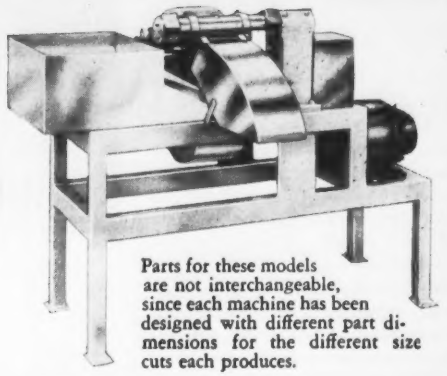
For more information on product at left, circle 7164 . . . see information request blank opposite last page.

URSCHEL

Models **F, G, H** *and* **GK** *...*

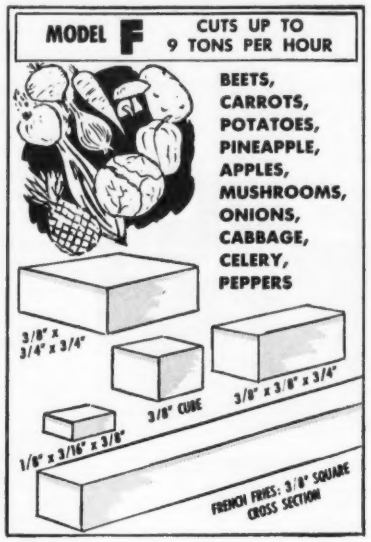
are **4** *Separate Cutting Units!*

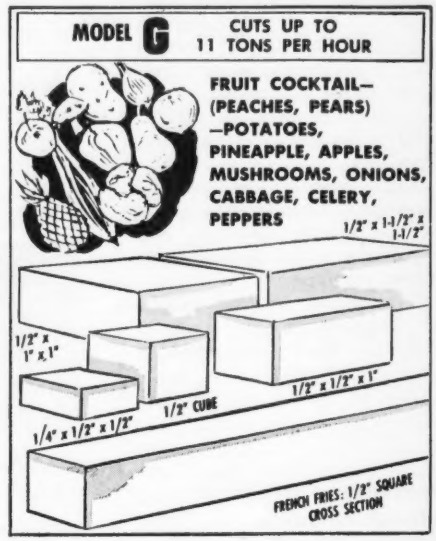
They all look alike...all operate alike

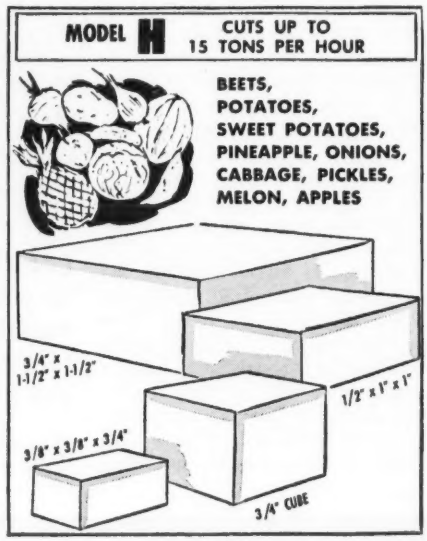


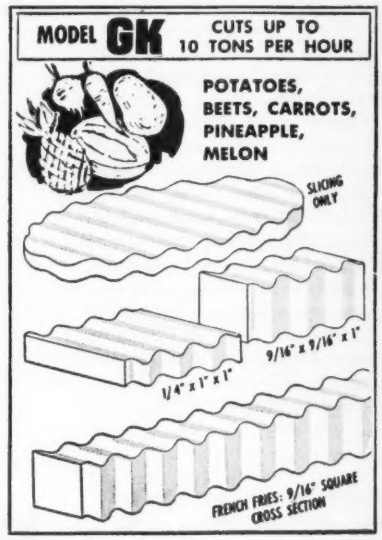
Parts for these models are not interchangeable, since each machine has been designed with different part dimensions for the different size cuts each produces.

...but each produces a different range of cut sizes!


MODEL F
CUTS UP TO 9 TONS PER HOUR
BEETS, CARROTS, POTATOES, PINEAPPLE, APPLES, MUSHROOMS, ONIONS, CABBAGE, CELERY, PEPPERS
3/8" x 3/4" x 3/4"
3/8" CUBE
3/8" x 3/8" x 3/4"
1/8" x 3/16" x 3/8"
FRENCH FRIES: 3/8" SQUARE CROSS SECTION


MODEL G
CUTS UP TO 11 TONS PER HOUR
FRUIT COCKTAIL—(PEACHES, PEARS) —POTATOES, PINEAPPLE, APPLES, MUSHROOMS, ONIONS, CABBAGE, CELERY, PEPPERS
1/2" x 1-1/2" x 1-1/2"
1/2" x 1" x 1"
1/2" CUBE
1/2" x 1/2" x 1"
1/4" x 1/2" x 1/2"
FRENCH FRIES: 1/2" SQUARE CROSS SECTION


MODEL H
CUTS UP TO 15 TONS PER HOUR
BEETS, POTATOES, SWEET POTATOES, PINEAPPLE, ONIONS, CABBAGE, PICKLES, MELON, APPLES
3/4" x 1-1/2" x 1-1/2"
1/2" x 1" x 1"
3/8" x 3/8" x 3/4"
3/4" CUBE


MODEL GK
CUTS UP TO 10 TONS PER HOUR
POTATOES, BEETS, CARROTS, PINEAPPLE, MELON
SLICING ONLY
9/16" x 9/16" x 1"
1/4" x 1" x 1"
FRENCH FRIES: 9/16" SQUARE CROSS SECTION

The product to be diced is fed first to the inside of a slicing shell, where it is then rotated by an impeller at high speed. Centrifugal force causes product to slide around the inside surface of slicing shell. As product approaches top of this shell it slides over an adjustable slicing gate which controls slice thickness. Slicing knife is at top of slicing shell. At the instant of slice, cross cut knives ride down, cutting slice crosswise into strips, or french fry cuts. These knives throw the product into the revolving circular knives that cut the strips into cubes.

This new cutting principle has many advantages over previous methods. When slicing any product with a knife, the product tends to crack parallel with the knife's edge, particularly in brittle, root vegetables. Product cracking is overcome by cutting parallel with the strains set up, thus eliminating strains and the resultant cracking.

Product damage is eliminated by moving the product in a straight line from the time the first cut is made until the last cut is made, which reduces impact and crushing, and makes possible the high operating speed and quality of cut produced.

PRECISION HIGH-SPEED FOOD CUTTING EQUIPMENT

URSCHEL LABORATORIES INC.
VALPARAISO, INDIANA

Designers and manufacturers of precision, high speed cutting equipment for food products

7165 on Reader Service Slip.

fered by Weighing & Controls, Inc.

Such systems range from the simplest — consisting of a platform scale and remotely located readout unit, and set up to reject packages on the basis of a single plus-or-minus weight tolerance — to a sophisticated multi-function system comprised of a weighing scale and appropriate control instrumentation.

This zone-control system categorizes off-weight condition according to specific weight zones, and produces a transducer signal that can be used to indicate, record and/or totalize weight and thru-put data.

Same system also can be used for automatic segregation of the reject packages, and regulation of the packaging or filling machinery.

In addition to photographs of components, the bulletin contains block diagrams of typical systems.

7166 on Reader Service Slip.

Economical, four-digit electric counters

Available for base, top or panel mounting, small electric counters will operate dependably at speeds up to 600 counts per minute.

Operation of Model 4-Y-9434 counter is based on escapement drive mechanism. Driving parts are of nylon and drive shaft is of hardened SS.

Standard models operate at 115 v, AC; models for DC operation are also available. Counters are priced at $14.00.

Supplier: Durant Manufacturing Company, 1951 N. Buffum St., Milwaukee 1, Wis.

7167 on Reader Service Slip.

Burner's modular design halves installation costs

Individual units of new gas-fired infra-red line burner can be built up into panels or continuous lines without a complex pipe manifold for gas distribution.

Reduction of manifold and elimination of a requirement

SARCO

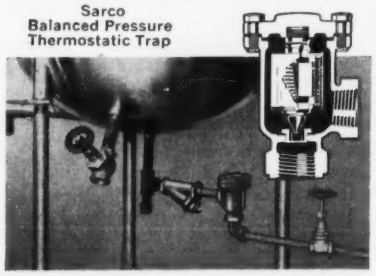
NOW... MATCH STEAM TRAPS

THERE'S no such thing as an all-purpose steam trap. That's why it pays to know what each trap has to offer. Here are five examples that demonstrate how you can match the correct steam trap type to the exact requirements of *each* application.

EXAMPLE 1: Outside Tracer Lines: A tough set of requirements

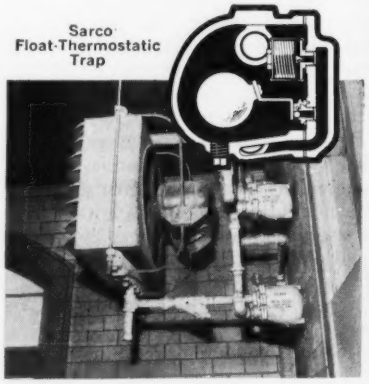
One of the most demanding sets of requirements a steam trap has to face is found in *outside steam tracing*. The trap must not only rid tracer lines of condensate and air immediately they're formed, but it must do so under exacting conditions. Pressures on each trap may vary widely. Installations may be remote and inaccessible to service. Water hammer may be a constant threat; freezing may be a hazard. Only the unique Thermo-Dynamic trap takes all these demands in stride. The Sarco TD-50 operates perfectly *without adjustment* through its full pressure range of 10-600 psi. It's virtually immune to water hammer and won't freeze when installed with a free discharge. Maintenance is, therefore, negligible. Compact, requiring no external support, the TD-50 is just about the easiest trap in the world to install. Once it's installed, you can forget it. You can count on an extremely long, trouble-free service life with minimum maintenance attention.

More closely than any other model, the TD-50 approximates an all-purpose trap. However, special application requirements might dictate the use of another type of Sarco trap. Sarco engineers stand ready to help you solve any trapping problems.



EXAMPLE 2: For steam jacketed process kettles: a trap that operates immediately on start-up and self adjusts to both low and high pressures

When a large steam-jacketed process kettle starts up, the condensate load is high, and all air in the jacket must be released quickly. At this stage, however, the jacket pressure is low; yet it builds up rapidly as the process continues. Because a SARCO No. 9 Balanced Pressure Thermostatic Trap is wide open on start-up, it releases initial air and condensate without the need for a bypass. And because it is self-adjusting, it works just as efficiently during the first processing stage when the jacket pressure is high. There are no seats to change for various working pressures. You can see why it is the obvious choice for steam jacketed process kettles.



EXAMPLE 3: How to prevent water-logging in unit heaters and blast coils

All unit heaters and blast coils have a relatively small internal volume in comparison with their steam condensing capacity. Even slight water-logging can reduce heat output seri-

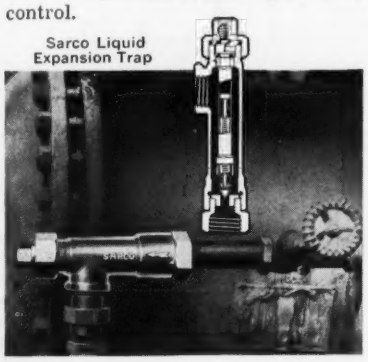
Impartial advice on trapping because
ONLY SARCO MAKES ALL 5 STEAM TRAP TYPES

TOPICS

TO YOUR TRAPPING NEEDS

ously. Pressures may vary widely under automatic temperature control and so may the load because of variable demand. A trap to handle this application must adjust itself instantly to pressure and load charges. The most precise answer to this problem is the SARCO Float and Thermostatic Trap—and here's why: it releases air on start-up and during running, and, because it discharges condensate continuously, it does not set up in the system violent pressure changes that would upset close control.

Sarco Liquid Expansion Trap



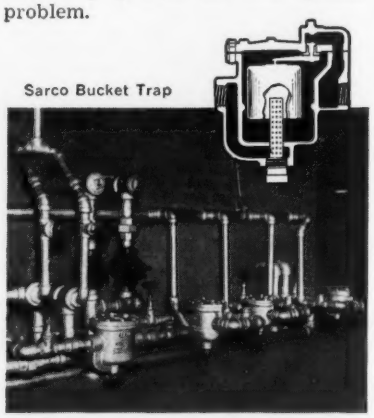
EXAMPLE 4: How to release low temperature condensate

When condensate cannot be returned to the boiler feed tank either because of distance or because it may be contaminated, it's economical to utilize some of the sensible heat as well as the latent heat of the steam.

For this purpose a trap must be capable of releasing condensate to temperatures as low as 100° F.

The sound trap selection here is the SARCO No. 871 Liquid Expansion Trap because it can be set to release condensate at temperatures down to 100° F. regardless of supply pressure. This performance assures maximum steam economy. The Sarco No. 871 handles the starting load easily because of its wide open valve, which throttles the flow as the condensate temperature rises. Furthermore waterhammer cannot reach the operating element. No other type is as nearly perfect for this specific problem.

Sarco Bucket Trap



EXAMPLE 5: Economic handling of Water Hammer and Corrosive Conditions

In applications in which water hammer or corrosive conditions are encountered but in which low pressures or extremely high back pressures preclude the use of the Thermo-Dynamic trap, the Sarco Inverted Bucket Trap is recommended. While the Sarco I. B. is not exactly a fuel miser, its relatively rugged construction will withstand considerable water hammer; and, when it is fitted with stainless steel internal parts, it offers excellent resistance to corrosion.

* * *

CONCLUSION: The right application is the economical installation

When you choose steam traps that serve their purpose without frequent adjustment, and without maintenance or replacement problems, you save on down-time, man-hours, spare parts, and production slowdowns.

You can get the money-saving solution to every trap selection problem by consulting Sarco. You get impartial solutions, because only Sarco makes all 5 types of steam traps: Thermo-Dynamic*, Thermostatic, Float Thermostatic, Liquid Expansion, and Bucket.

You also get the benefit of Sarco's 50 years of specialized experience in the manufacture and application of temperature regulators, industrial air vents, pipeline strainers, dial and industrial thermometers, heating and cooling controls, heat exchangers, heating control systems and heating specialties.

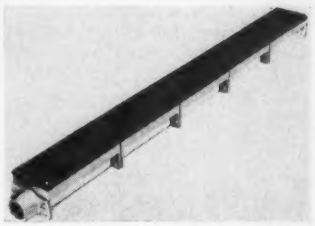
For literature or impartial help in solving your steam trapping or control problems, contact your local Sarco Sales Representative, or write direct to Sarco. 1440

*U.S. Pat. No. 2,817,353. T.M. Reg. U.S. Pat. Off.

SARCO

SARCO COMPANY, INC.
635 MADISON AVENUE, NEW YORK 22, N. Y.
PLANT: BETHLEHEM, PA.
STEAM TRAPS • TEMPERATURE CONTROLLERS
STRAINERS • HEATING SPECIALTIES

7168 on Reader Service Slip.



Up to 24 in-line units can be serviced by each mixture inlet

for individual inlets, controls and pilots for each unit provides a considerable saving in installation costs.

The Infra-Line radiant burner operates at mixture pressures up to 16 in. w.c. Burners light full length of extended line from one pilot — and also will light from one line to an adjacent line.

An internal distributor assures uniform heat that is insensitive to air-pressure variations.

Each Infra-Line burner section is six in. wide by 12 in. long, with a rated capacity of 30,000 BTU.

Supplier: Infra-Line, Inc., P.O. Box 8434, Cleveland 34, Ohio.

7169 on Reader Service Slip.

Aids engineers to solve fluid-flow problems

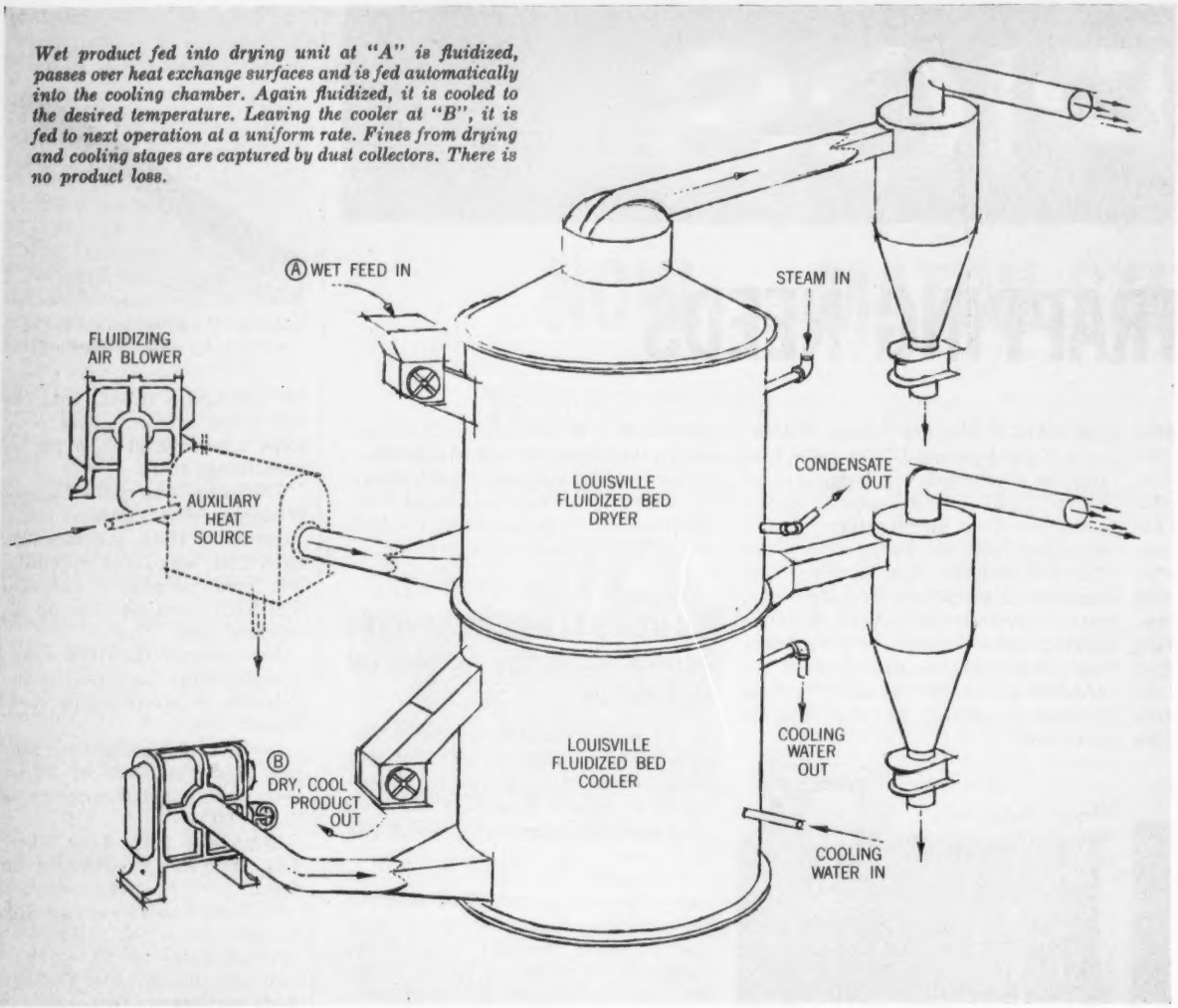
Engineering methods for solving hydraulic and pumping problems — from surveying for a deep well to calculating electrical pumping costs — are presented in Bulletin 77.

Available from Peerless Pump-Hydrodynamic Division, Food Machinery and Chemical Corporation, 20-page manual, Useful Pumping and Hydraulic Engineering Data, contains numerous charts and formulae.

Methods for finding pumping heads, horsepower requirements, pump efficiency and fluid flow are explained with sample calculations. Also included are weir and orifice charts, nomograph for friction loss in pipe and fittings, mechanical and electrical equivalents as well as miscellaneous data.

7170 on Reader Service Slip.

Wet product fed into drying unit at "A" is fluidized, passes over heat exchange surfaces and is fed automatically into the cooling chamber. Again fluidized, it is cooled to the desired temperature. Leaving the cooler at "B", it is fed to next operation at a uniform rate. Fines from drying and cooling stages are captured by dust collectors. There is no product loss.



Major break-through in drying and cooling techniques announced by

GENERAL AMERICAN

A new system for drying and cooling has been perfected by General American Transportation Corporation through their development of Louisville Fluidized Bed* equipment. Two Louisville units, one functioning as a dryer and one as a cooler are coupled vertically to provide a continuous automatic operation.

The system is particularly useful for crystalline chemicals, resins, polyvinyl acetate beads, polyethylene pellets, sugar and similar products having the proper particle size distribution.

Louisville Fluidized Bed equipment offers these advantages:

1. Accurate, instantaneous temperature control
2. High heat transfer that permits compact design
3. Low maintenance costs (no moving parts)
4. Less cleaning time and labor
5. Less floor space (equipment is vertical)
6. No hot spots (product is fully protected)

Because of their simplicity, Louisville Fluidized Bed dryers and coolers adapt readily to complete automation.

For full details about this revolutionary development in drying techniques, write Dept. B.

Process Equipment Division
GENERAL AMERICAN TRANSPORTATION CORPORATION
135 South LaSalle Street
Chicago 3, Illinois
Offices in principal cities

PROCESS EQUIPMENT DIVISION GENERAL AMERICAN TRADE MARK

*Patents Pending

7171 on Reader Service Slip.

5 to 1800 gph liquid feeders

Corrosion-resistant feeders have repeatability to within 1 per cent, are adaptable to automation, and have feeding range from 5 to 1800 gph.

Four-page bulletin presents detailed description of Omega Rotodip Liquid Feeder and its operation. Literature includes list of typical materials handled and schematic drawing of a dry-materials-to-liquids proportioning system.

Released by B-I-F Industries, literature, Ref No. 0065. 20-1, also lists dimensions.

7172 on Reader Service Slip.

Low-cost adsorbents lower color, FFA to . . .

Upgrade fats and oils

John H. Corbett
Celite Division
Johns-Manville Corporation

To meet higher trading specifications, reduction of color and free fatty acid (FFA) in fats and oils is being made easier through use of two recently developed synthetic silicate adsorbents.

Both of these adsorbents, Celkate T-21 and Micro-Cel T-13, can be used separately or at the same time. They can also be used in conjunction with conventional carbons or clays and thus supplement the action of those adsorbents.

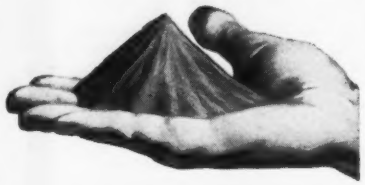
First adsorbent, Celkate T-21, is used to reduce color of fats and oils; it is also used to reduce color of frying oils employed in production of nuts, potato chips and chicken.

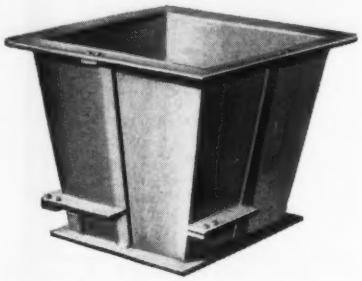
Decolorizing efficiency of the synthetic silicate adsorbent is high, see graphs.

Material to be treated is contacted with the silicate adsorbent for the optimum time and at selected dosage levels. Adsorbent is removed in conventional manner using standard fat clarification filters.

Celkate T-21 is a light-colored, synthetic magnesium

For accurate reproduction of bulk material formulations—W-C BATCH-WEIGHING SYSTEMS





In any batching operation—from simple dump-and-fill weighing to multi-ingredient ratioing — W-C Batch-Weighing Systems provide the reliably accurate net-weight control essential to consistent product uniformity.

Chief reason for this is the W-C Pneumatic Weight Transmitter. A rugged yet sensitive force-balance unit, it is capable of an accuracy of ±0.25% calibrated weight range, with reproducibility better than 1 part in 2000.

Each W-C Batch-Weighing System is designed to job specifications, using pre-engineered, unitized components of *known* performance capabilities. Consequently, you are spared the uncertainties—and costs—of "prototype" engineering . . . yet you realize the very tangible benefits of an application-engineered system built to your requirements.

Typical applications include: Batching flour, coffee beans, corn, oils for formulating or processing purposes.

Write for new Bulletin 14

W&C WEIGHING & CONTROLS, INC.
Div. of CompuDyne Corp.

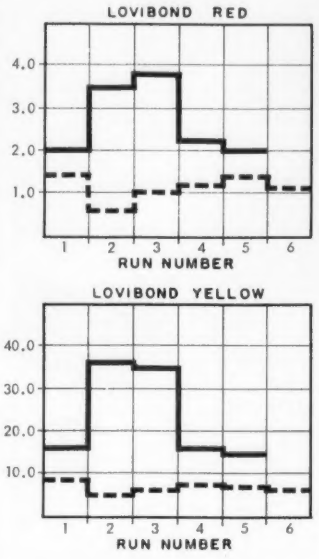
E. County Line Road • Hatboro 13, Pa.

7173 on Reader Service Slip.

control

silicate powder, produced by a hydrothermal reaction of diatomaceous silica and magnesia. It is priced at $0.075/lb in car load quantities.

Second synthetic silicate, Micro-Cel T-13, is of particular value in lowering free fatty acid in fats or oils when it is just above specification limits.



Results of actual plant runs of a dry-rendered lard using 0.15 per cent adsorbent at 175 F. Contact time was 15 minutes

Amount of free fatty acid adsorbed will depend on type of acids present, type of oil, temperature etc.

Plant and laboratory tests have shown that this silicate will adsorb roughly 1½-3 oz of free fatty acid per pound of adsorbent.

For example, a lard with a FFA content of 0.6 per cent is considered above a desired maximum of 0.5 per cent. Treatment of a 1000-lb batch of lard with 12 lb of silicate adsorbent will reduce FFA to 0.45 per cent at a cost of approximately $0.12/100 lb.

Micro-Cel T-13 is a calcium silicate. It also is produced by a hydrothermal reaction, in this case between diatomaceous silica and lime.

Supplier: Johns-Manville Corporation, 22 East 40th St., New York 16, N.Y.

7174 on Reader Service Slip.

The big PLUS SERVICE EXPERIENCE RESEARCH PERFORMANCE in Oakite

New, longer-lasting chain lubricant cleans while it lubricates

CONTINUING RESEARCH in materials opens new opportunities for up-dating maintenance and saving time and money.

Chain lubrication, done the Oakite way, for example, can help you cut down "bottlenecks" and bottle breakage. With newly developed Oakite LC106, chains get the "slip" that reduces gate pressure, bottle impact and jam-ups. It keeps chains clean . . . free of bottle soiling build-up. It reduces drag on motor, also cuts downtime for maintenance.

On top of this, users report up to 25% better "mileage" than previous material. As another "PLUS" a wide range of Oakite Lubricators is made available for continuous application of lubricating solution at proper rate without waste or drippage.

The big PLUS in Oakite

With every keg of Oakite material, you get plus benefits that help you reduce your cleaning costs. There's the personal help of the Oakite man, the experience of the entire Oakite organization; the latest information on modern cleaning methods to save extra work and time; *guaranteed* results; constant research devoted to development of newer, better materials. Ask your local Oakite man. Or, send for Bulletin F-10347. Oakite Products, Inc., 27A Rector Street, New York 6, N. Y.

OAKITE
over 50 Est. 1909 SCIENCE
years' leadership in industrial cleaning

Technical Service Representatives in Principal Cities of U. S. and Canada

7175 on Reader Service Slip.

ENGINEERING PERSPECTIVE
THROUGH A

VENTURI

Venturi tubes were first used for measuring fluid flow. While this application has increased substantially, the use of the Venturi in important unit process operations has increased even more. A Jet-Venturi combination is literally the heart of many important manufacturing processes.

JET REFRIGERATION
JET COMPRESSORS
JET CONDENSERS
JET HEATERS
JET PUMPS
JET MIXERS
JET REACTORS
JET ABSORBERS
JET FUME SCRUBBERS
SPECIAL JET VENTURI UNITS

During the first several years of the forty-two year history of our firm, we specialized entirely on steam jet vacuum pumps (ejectors). Many thousands of these are in service throughout the country and in most foreign countries. Our tradename, EVACTOR, is an important word in engineering circles. While steam jet vacuum pumps are still our major item, other applications of Jet-Venturi equipment are increasing constantly. With the exception of closely related products such as barometric condensers, CHILL-VACTORS, and CONVACTOR* systems, all of our activity is directed to the one purpose of making Jet-Venturi units more efficient, more dependable, more economical, and to apply them to an increasing number of industrial applications.

*The CONVACTOR is a dual condensing system for economic and efficient recovery of high boiling components from water vapor.

CROLL REYNOLDS

Croll-Reynolds CO., INC.

Main Office: 751 Central Avenue, Westfield, N. J.

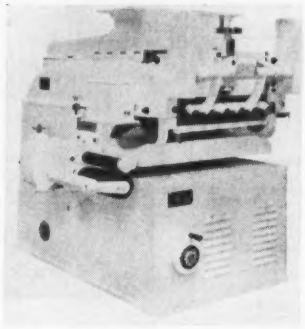
Chill-VACTORS® • Steam-Jet EVACTORS® • Aqua-VACTORS® • Fume Scrubbers • Special Jet Apparatus

7176 on Reader Service Slip.

processing

Dough divider produces 200 pieces/min

Bread-dough divider is manufactured either as 6-pocket or 8-pocket unit. Smaller model has capacity of 150 pieces



per min or 9000 pieces per hour; larger model has capacity of 200 pieces per min or 12,000 pieces per hr.

Loaf discharging and conveying, as well as scaling, can be accurately adjusted on machine. Automatic ram pressure compensator assures uniform pressure on dough.

Unit is powered by 7½ hp motor.

Supplier: Food Machinery Division of Baker Perkins Inc., 1000 Hess, Saginaw, Mich.

7177 on Reader Service Slip.

Line of versatile, centrifugal pumps

Uses: For handling clear water. Pumps can also be modified for pumping corrosive liquids and solids in suspension.

Features: Each pump in line is NEMA-matched; that is, pump dimensions align with those of NEMA-rated motors. Consequently, installation is easy, conversions are quickly made.

Pump frames are constructed to receive various volutes and impellers. As a result, each pump can be changed to meet a variety of pumping requirements in regard to gpm and feet of head.

Description: Line of Adapt-Able pumps is made in both, conventionally mounted horizontal, and vertical pump and

HAMMOND Screw-Lift

Provides POSITIVE DELIVERY OF FREE-FLOWING BULK MATERIALS FROM RECEIVING HOPPER TO POINTS OF PROCESSING, PACKING OR STORAGE

Totally Enclosed — Dust-Tight — Sanitary

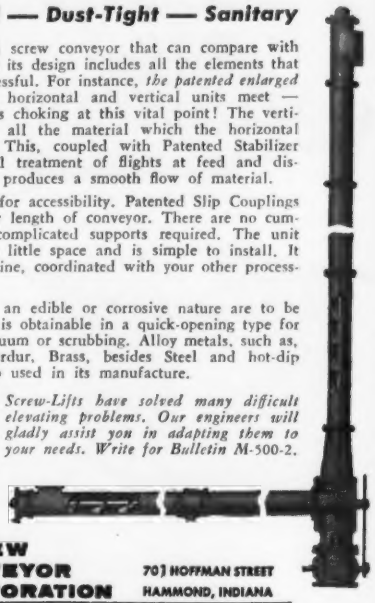
There is no vertical screw conveyor that can compare with a Screw-Lift because its design includes all the elements that make operation successful. For instance, *the patented enlarged junction* where the horizontal and vertical units meet — that's what forestalls choking at this vital point! The vertical screw takes up all the material which the horizontal unit feeds into it. This, coupled with Patented Stabilizer Bearings and special treatment of flights at feed and discharge ends further produces a smooth flow of material.

The casing is split for accessibility. Patented Slip Couplings permit removing any length of conveyor. There are no cumbersome drives or complicated supports required. The unit is compact, requires little space and is simple to install. It functions as a machine, coordinated with your other processing equipment.

Where materials of an edible or corrosive nature are to be handled, Screw-Lift is obtainable in a quick-opening type for easy cleaning by vacuum or scrubbing. Alloy metals, such as, Stainless Steel, Everdur, Brass, besides Steel and hot-dip galvanizing, are also used in its manufacture.

Screw-Lifts have solved many difficult elevating problems. Our engineers will gladly assist you in adapting them to your needs. Write for Bulletin M-500-2.

Three of the largest feed processing plants in the U.S.A. have over 100 Screw-Lifts in continuous operation



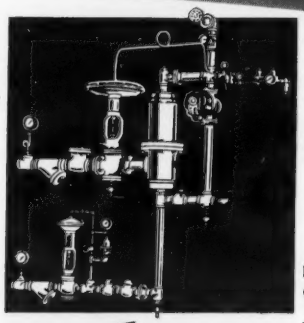
SCREW CONVEYOR CORPORATION
7013 HOFFMAN STREET
HAMMOND, INDIANA

Southern Plant: WINONA, MISSISSIPPI
West Coast Plant: SANTA CLARA, CALIFORNIA

Branch Offices: Hackensack, N. J. · Dallas, Texas · Memphis, Tenn. · Tampa, Florida

7178 on Reader Service Slip.

CUT HOT WATER COSTS



Pick STEAM INJECTION HOT WATER HEATERS

8 sizes . . . 500 to 50,000 Gals. Per Hour

Hot water in a flash — produced only as it's needed!

Pick patented mixing chamber is completely automatic . . . direct contact of steam and water provides desired hot water temperature *instantaneously* . . . temperature accurately maintained by thermostatic controls.

Water volume adjustable from 5% to full rated capacity of heater. 20-second reaction to desired up-and-down changes in water temperature.

Write today to Dept. K

FREE BULLETIN Shows how Pick Heaters are used in many industries.

Pick WATER HEATERS

PICK MFG. CO., Wauk[illegible]

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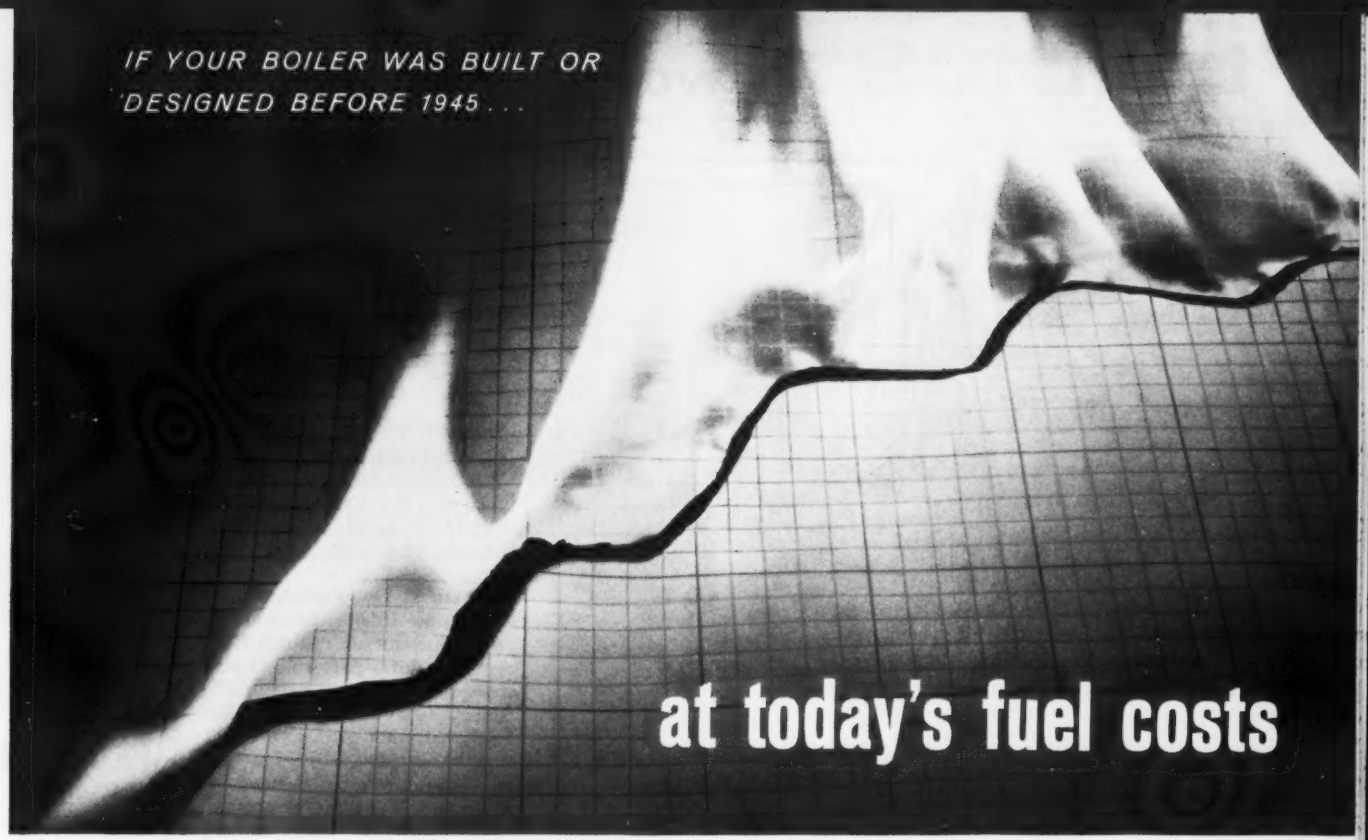


you may be paying for it a second time!

Are you operating a boiler that was designed in the day when fuel costs were much lower? Just since World War II, fuel prices have soared. And these higher costs put a premium on "little" inefficiencies that might have been ignored when your boiler was built.

Conversion is not the answer. You cannot buy efficiency in a boiler designed for solid fuels simply by switching to a conversion-type oil or gas burner. The answer is a *truly* packaged Cleaver-Brooks boiler — with all components designed to work together — fully factory-assembled and fire-tested.

To further provide and maintain top efficiency, modern Cleaver-Brooks packaged boilers offer a combination of fuel-saving design standards that cannot be found in any other boiler — at any price.

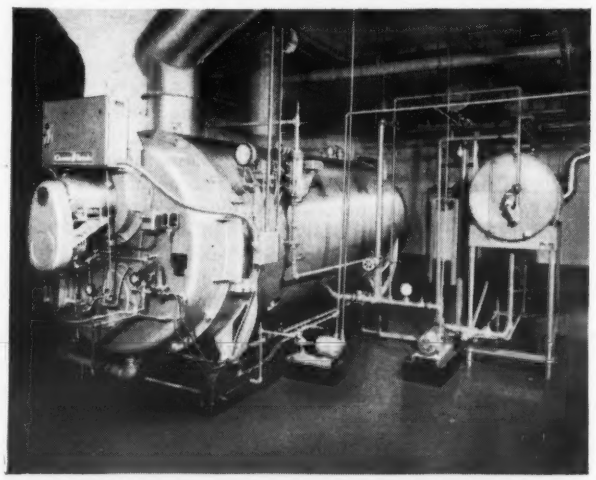
This combination of features — *four-pass design, forced-draft combustion, updraft construction and all the advantages of five square feet of heat-transfer surface per boiler horsepower* — puts your fuel costs down where they belong.

All this is provided by Cleaver-Brooks in the most compact, automatic packaged unit on the market. Sizes through 600 hp . . . oil, gas and combination oil-gas firing . . . larger sizes in Cleaver-Brooks Springfield water-tube boilers. *All* models are expertly started for you by a trained field engineer.

See your local Cleaver-Brooks agent for more detailed information, or write for the booklet, *How to Select a Boiler.*

GETTING MORE HEAT FOR THE FUEL DOLLAR

The W. T. Rawleigh Company, manufacturer of toiletries, medicines and food products for the home and farm, replaced two old firebox boilers in their Memphis, Tennessee, branch with one fully automatic, combination-fired CB boiler. Mr. James Trindle, office manager, reports: "Our records show . . . 36.4% less fuel consumed during winter months that averaged about 12% colder than the previous year. We're getting greater fuel economy than we expected."



Cleaver Brooks®

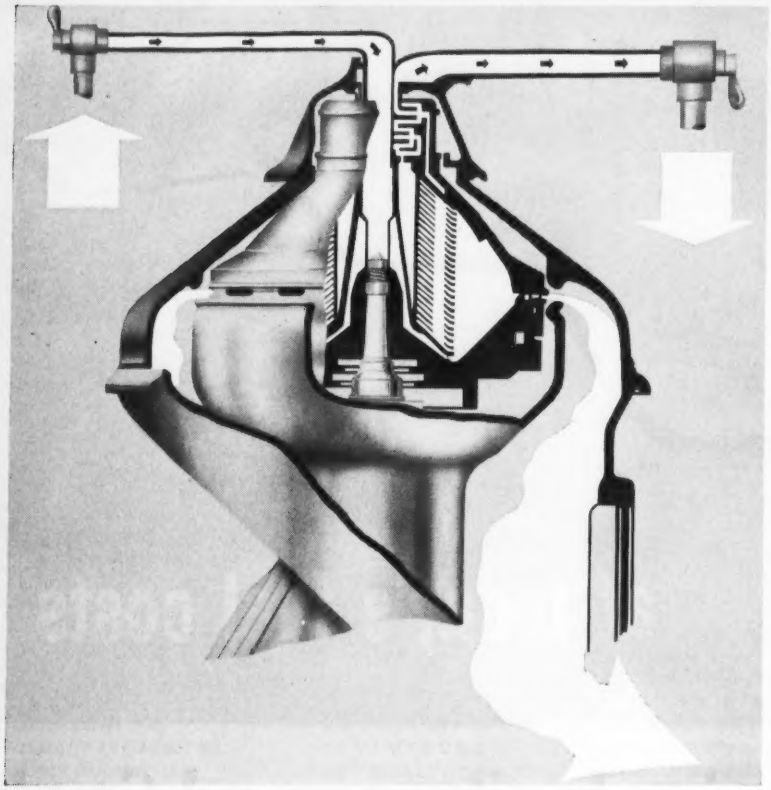
ORIGINATOR AND LARGEST PRODUCER OF PACKAGED BOILERS

CLEAVER-BROOKS COMPANY

Dept. P, 357 E. Keefe Ave., Milwaukee 12, Wisconsin

7180 on Reader Service Slip.

FLUIDICS* AT WORK



Why the Titan can solve your tough centrifuging problems

Start with the all-important question of *separating* power.

Compare what the Pfaudler® Titan Superjector gives you with any other centrifuge—up to 7580 times gravity. This is much more force than most continuous centrifuges offer.

Next, consider how important continuous operation is. With the self-cleaning Titan you can make your separation process part of a continuous-flow operation.

Hydraulic controls for opening slots result in instantaneous ejection of solids. Note: We said slots, not nozzles. Slots that will handle particles up to ⅛" dia.; slots that won't clog; slots that keep down time to the minimum.

You get high capacity, too—up to 6000 gallons per hour.

It all adds up to the fact that the Titan can solve even the most difficult separating problems. Like separating two liquids and a solid simultaneously; handling solids that are only slightly heavier than liquids, liquids that are highly viscous or aerated, particles that are fine, slimy or abrasive.

Our Bulletin 946 gives you complete details.

Test, anyone? We'd be happy to test your products in our Engineering Test Center or in *your* plant with a portable production unit.

Address inquiries to our Pfaudler Division, Dept. FP-120, Rochester 3, N. Y.

*FLUIDICS is the Pfaudler Permutit program that integrates knowledge, equipment and experience in solving problems involving fluids.

PFAUDLER PERMUTIT INC.

Specialists in FLUIDICS. . .the science of fluid processes

7181 on Reader Service Slip.

motor units.

Both models in line are available with cartridge-type mechanical seals or conventional stuffing boxes.

Supplier: Fairbanks, Morse & Co., Pump and Hydraulic Division, 3601 Kansas Ave., Kansas City, Kansas.

7182 on Reader Service Slip.

Spray-drying nozzle for high-solids liquids

Uses: For spray drying highly abrasive or corrosive liquids with high solids contents.

Features-Description: Nozzle has single-inlet swirl chamber which produces a natural, free-vortex flow pattern. Design minimizes friction and produces improved spray and wear characteristics.

SDX nozzle delivers a uniform hollow-cone spray pattern and is capable of producing good atomization at reduced pressures. Its body is manufactured of stainless steel while tungsten carbide is used in critical wear areas.

Supplier: Delavan Manufacturing Company, West Des Moines, Iowa.

7183 on Reader Service Slip.

50 to 1550 gpm cyclone classifiers

Rubber-lined liquid cyclone classifiers are made in 6-in., 12-in. and 24-in. diameters. Smallest unit separates from 25 to 40 microns, intermediate unit from 35 to 45 microns and largest unit from 50 to 60.

Each classifier can be furnished with one of several apex valve openings and vortex finders.

DorrClone® classifiers, made by Dorr-Oliver Incorporated, are described in detail in eight-page Bulletin No. 2503. Brochure illustrates each classifier and lists capacities, separation and operating results.

Description of underflow control, which maintains a reasonably constant underflow density automatically, is included.

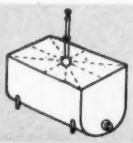
7184 on Reader Service Slip.

KLENZADE

IN • PLACE Spray Cleaning

FOR THE FOOD PROCESSING INDUSTRIES

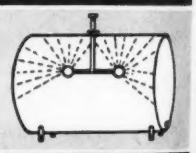
New Cleaning Techniques Save Time – Cut Costs



Processing Vats—in-place spray cleaning or portable units for batteries of similar vats.

KLENZADE MODERN

Storage Tanks — complete systems for pipeline cleaning and in-place spray cleaning.



CLEANING AIDS

Over-the-Road Tanks — in-place spray cleaning for haulers of lard, edible oils, liquid eggs, liquid sugar, etc.

Recirculation Cleaning

Complete semi or fully automatic systems for cleaning and sanitizing pasteurizers, evaporators, vacuum pans, pressure cookers, high temperature equipment.

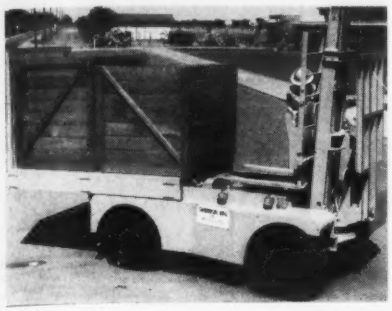
Write for Descriptive Literature

KLENZADE PRODUCTS, INC.

Systematized Sanitation All Over the Nation

Dept. 31M BELOIT, WISCONSIN

7185 on Reader Service Slip.



Piggyback carriage retracts to allow forks to return frontward, then moves forward to tighten load. Loaded front and rear (right) carrier is ready for road service

'Piggyback' fork truck

Carries three times greater payload

Six-pallet carrier is standard size, operates in field or warehouse

FRED VOIT, Manager
JOHN IELMINI, Manager, Production Control
Patterson Frozen Foods
KARL ROBE, Associate Editor

Problem: Patterson Frozen Foods, Patterson, Calif., have expanded so rapidly in the last five years that their newest frozen storage warehouse had to be located across the street.

This meant a longer haul when transporting frozen product from processing or present storage facilities to new warehouse. For this shuttle operation, fork trucks were used.

Hauling loose frozen vegetables in bulk bins would tie up two or three fork trucks and drivers, carrying two 1000-lb bins over the 300-ft distance and return. Patterson was looking for a method to speed this operation.

Solution: Patterson tried a patented six-pallet fork truck made by a nearby manufacturer — Shimmon Mfg. Co., 424 S. Emerald Ave., Modesto, Calif.

The Shimmon fork truck carries four 1000-lb pallet loads (stacked two high) on a sliding carriage at the rear, and two more on the forks in front.

Here's how it operates: Driver forks and lifts a two-high stack conventionally. Fork assembly swivels 180 degrees to place bin on rear carriage.

Sliding carriage moves backward to clear forks, and another two-high load is placed on carriage. Carriage further retracts to allow forks to return to front.

Driver then tightens load by compressing carriage forward until load is tight against front retainer.

Driver then forks third two-high pallet load and proceeds to destination.

Swivel fork performs the functions of a side-shifter, will pick up a pallet that sets at an angle to the fork approach.

Power steering increases maneuverability. Truck uses conventional mast and four hydraulic valves, same as a comparable two-pallet carrier with side shift.

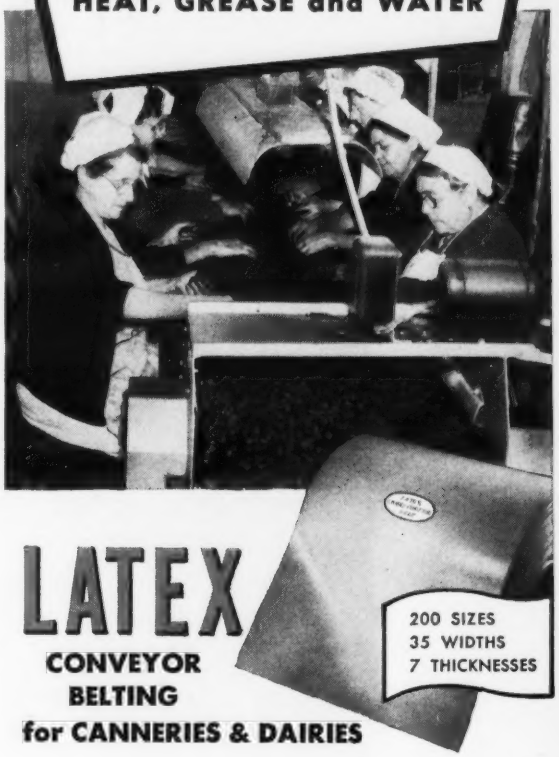
Lift height of Patterson truck is eight ft maximum at fork level. Bins up to four by four ft are handled.

During season, the Shimmon six-pallet carrier will operate in field to collect bulk bins as they are filled by pickers. In field work, conventional fork trucks tend to "dig in" or lose traction because of weight distribution.

In the Shimmon truck, weight distribution can be changed to fit varying situations, simply by moving the carriage forward or back. This works for most field situations, whether truck is partially loaded or empty.

Results: Since truck carries six pallet-

The CONVEYOR BELT that RESISTS ACIDS HEAT, GREASE and WATER



Economy-minded canners and dairy men have found in our LATEX belt the answer to all their problems. This solid-woven cotton belt is impregnated and coated with neoprene latex and is completely resistant to water, acids, grease and heat. Odorless and pliable to –40°F., this high tensile belt not only has a LONGER LIFE expectancy than most belts but COSTS LESS. Loaded with special features for canners, dairies and food storage plants, yet it's in the price range of run-of-the-mill conveyor belts. Get the facts and you'll decide on BUFFALO LATEX.

Send for Free Manual

that fully illustrates and describes our belts, their sizes, prices and uses.

BUFFALO WEAVING AND BELTING CO., INC.
204 CHANDLER STREET BUFFALO 7, NEW YORK
NEW YORK • CHICAGO
We also manufacture a complete line of WEBBINGS & PURE SHEET RUBBER

7186 on Reader Service Slip.

WHAT'S THE TRUE COST OF YOUR TRUCK OPERATION?

NO INVESTMENT...NO UPKEEP

LEASE HERTZ

Company-owned trucks cost money—in maintenance, in spare parts and equipment, accounting, clerical help . . . and executive time. But Hertz Truck Lease Service reduces all this expense to the writing of one budgetable check a week! What's more, Hertz Truck Lease Service releases capital for expansion, equipment, inventory—and puts your truck operation on a high level of efficiency you've probably never known before!

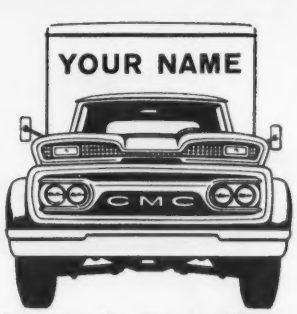
Hertz gives you cash for your present trucks. You get new GMC, Chevrolet or other sturdy trucks of your choice—all bearing your company identification—all custom-engineered to your specifications. Or your present trucks can be reconditioned and leased back to you. Either way, you're out of the truck and repair business. And you're back in your business *full-time* with new found capital that's ready to work.

Just one budgetable check per week includes these Hertz services: complete truck maintenance, garaging, washing, licensing, insurance, and emergency road service. Hertz will also provide needed replacement trucks—and extra trucks for peak periods.

Hertz gives you more—much more! You benefit from the experience of the oldest, most respected name in truck leasing. You benefit too from the convenience and efficiency of the fully-staffed, fully-equipped Hertz local truck stations throughout the U. S. and Canada. Call your Hertz Truck Lease Office for details. Or write for booklet—"How To Get Out Of The Truck Business"—to: HERTZ TRUCK LEASE, 660 Madison Avenue, New York 21, N. Y., Dept. N12.

HERTZ TRUCK LEASE ®

TRUCKS



HERTZ ALSO RENTS TRUCKS BY THE HOUR, DAY OR WEEK

7187 on Reader Service Slip.

ATLAS-PACIFIC TRAVELING BELT WHOLE FRUIT GRADER

CLEAN • FAST • ACCURATE GRADING

This modern Atlas-Pacific Whole Fruit Grader is the answer to your problems of grading any product similar to apricots, peaches, or apples, which require the accuracy of a round whole grader with a large capacity, and gentle handling.

The machine accurately and carefully grades ten (10) tons of apricots per hour and is manufactured in a basic unit of one grading belt (giving two grades) to which any number of grading units can be added. The most popular size and what we call our standard machine has five (5) grading units producing six (6) grades. It makes no difference how many grades you require, the machine will carefully handle and accurately grade ten (10) tons per hour.

Due to the special design of the grading belt supports and discharge mechanism, the product will not stick in the holes, thus insuring a full, clear grading area of the belts at all times for each grade.

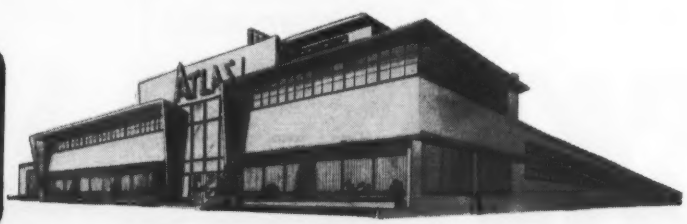
The traveling grader belts are made of heavy gauge woven steel and are then coated with an accurate thickness of neoprene. This insures gentle handling and extreme accurate grading.

One motor operates the entire grader and the drive of the discharge belts can be made to discharge the graded product on the right or left side, or some right and some left, to meet your requirements. All driving parts are enclosed in hinged heavy gauge steel covers. As the result of the continuous operation of the grader belts and the rugged construction of the machine, it can be operated whether bolted down or not.

SPECIFICATIONS
for 5 belt, 6 grade machine:

Length Over All	24′
Width Outside Discharge Belts	8′
Height	4′-6″
Weight Approximately	2,000 lbs.
Cubic Feet	864

ATLAS-PACIFIC ENGINEERING COMPANY, INC.
1321 67th Street • Emeryville, Calif.



7188 on Reader Service Slip.

Truck carries three times former payload to new warehouse in background

loads per trip, warehouse operation has been speeded up three times. One truck and driver handle three times former payload per trip.

Field work is speeded during height of season when the need is maximum.

Cost of six-pallet carrier is comparable to similarly equipped conventional fork truck. Maintenance is about the same.

7189 on Reader Service Slip.

Increases depalletizer efficiency by 125%

Improvements which have made it possible to increase operating efficiency of case depalletizer by 125% are described and illustrated in 6-page fold-out bulletin issued by Alvey Conveyor Manufacturing Co.

Depalletizer, designated as the "300" series, is designed to receive a pallet load of cases and automatically unload 40 to 50 cases per minute.

Equipment is electronically controlled and power actuated with electric motors. Controls permit changing depalletizing operation from one case to another with just a turn of the switch.

Unit can be equipped to depalletize with a variety of pallet stacking patterns. Step by step action is illustrated in the bulletin. General specifications are also included.

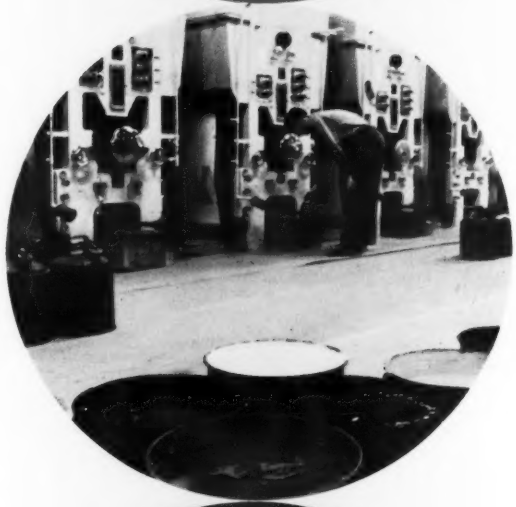
7190 on Reader Service Slip.

For more information on product at right, circle 7191 . . . see information request blank opposite last page.

OTHER OLIN PACKAGING PRODUCTS: CONTAINERS, BAGS, CELLOPHANE, POLYETHELENE, FINE PAPER
Write for Illustrated Brochure "The Olin Carton Service"

It takes more than paperboard to make

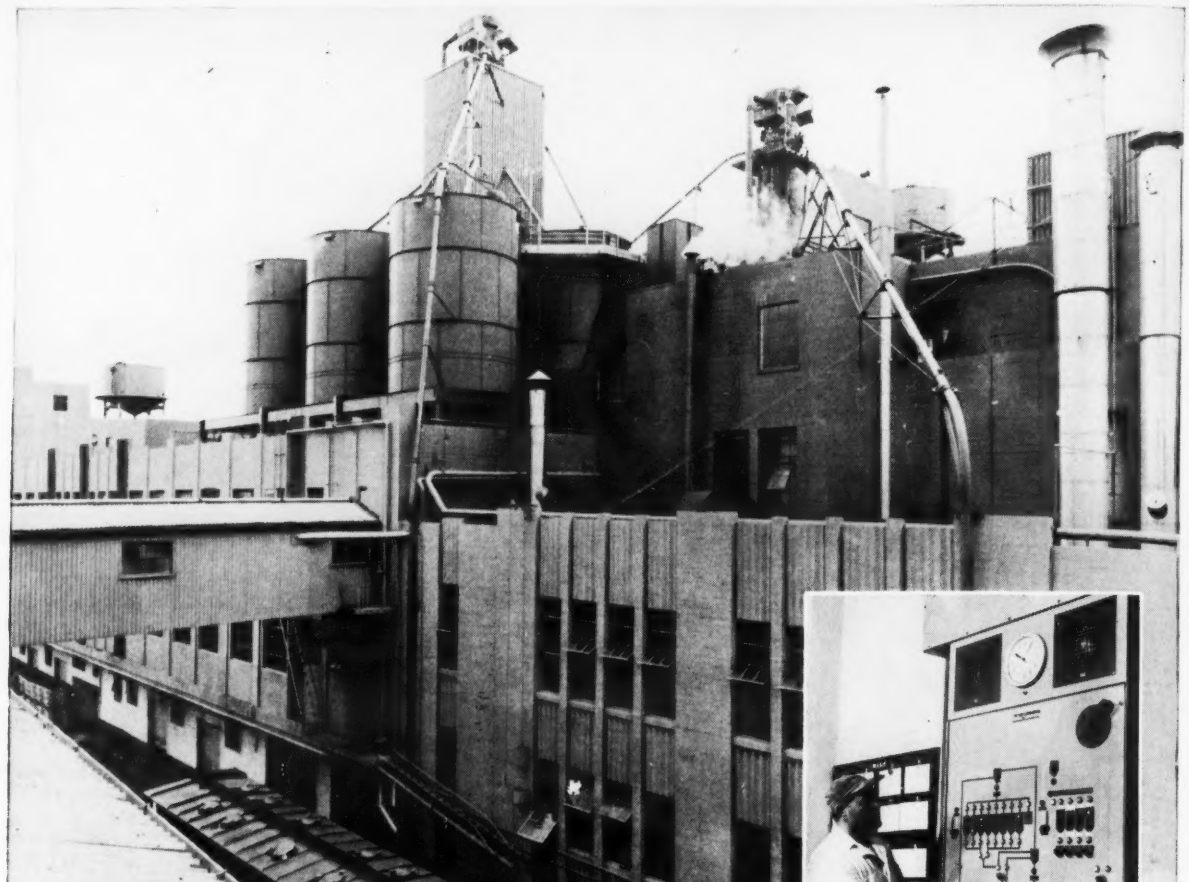
OLIN CARTONS



printing skills • ***modern equipment*** • ***resources*** • ***basic research*** • ***quality control*** • ***package design*** • ***dedication . . .***

OLIN MATHIESON
Packaging Division
P. O. Box 488, West Monroe, Louisiana

OTHER OLIN PACKAGING PRODUCTS: CONTAINERS, BAGS, CELLOPHANE, POLYETHELENE, FINE PAPER
Write for illustrated Brochure "The Olin Carton Service"



Above: Two complete Fuller systems capable of emptying 100,000 lb. car in three hours, unload General American Dry-Flo® cars to storage bins on the roof.
Right: Graphic, push-button, one-man control panel handles unloading, conveying and reclaiming.

NO PLACE TO GROW BUT UP

. . . so Burgermeister put 12 new storage bins on the Brewhouse roof

Putting a head on beer is one thing, but putting a head on the Brewhouse roof might seem an insurmountable obstacle. This growing San Francisco brewery was up against it for storage space. With no further room for lateral expansion, the only place to grow was up—but how? Could additional bins be loaded at such a height?

Fuller engineers were able to provide the answer. Airveyor® Pneumatic Conveying Systems don't balk at height. So twelve additional bins were mounted on top of existing equipment, and two separate Airveyor systems were installed. They even incorporate components from an existing Airveyor system which had been installed in 1947.

Now, with ample storage space, grits are unloaded from covered hopper cars to bins in just over three hours per 100,000-lb. car. The same quantity of malt travels the route in a little over two hours. And reclaiming and blending are handled at an equally high rate—all controlled by one man at a Fuller graphic control panel. Burgermeister has greater production with greater economy — as breweries must do to keep ahead today.

The success of Fuller in handling problems like those at Burgermeister is confirmed by repeat orders from customers everywhere. Breweries nation-wide look to Fuller to study their needs for expansion, higher production and for new brewery installations. Why not find out for yourself why they do it—and what Fuller can do for you? 2625 A-29 2

FULLER COMPANY GENERAL AMERICAN TRADE MARK

FULLER COMPANY
176 Bridge St., Catasauqua, Pa.
Subsidiary of General American Transportation Corporation
Offices in Principal Cities Throughout the World

Fuller
. . . . pioneers in harnessing AIR

7192 on Reader Service Slip.

Guide to unit-load handling via bin boxes

Widespread adoption of pallet and skid systems has demonstrated the savings possible by handling materials in large unit loads.

Where such systems are not adaptable, unit-load mechanical handling advantages may be gained through use of one form or another of bin box.

Profusely illustrated 12-pg brochure offered by National Wooden Box Association considers designs, material requirements, types and features of these high-capacity handling containers.

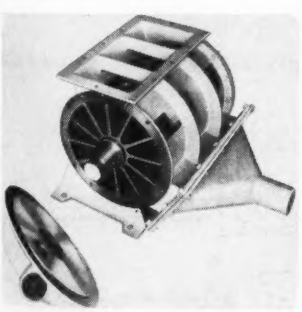
More than a mere catalog of available types, the brochure points out the important factors to consider in determining how such containers will be effective in particular applications.

7193 on Reader Service Slip.

Feeder runs freely without 'gumming' or 'sticking'

Recently developed and patented high-pressure feeder eliminates bearing trouble often experienced when conveying certain types of product pneumatically.

Design feature of "Air-Swept" feeder are two hollow



Partially dismantled feeder, showing one of the two hollow end bells in which bearings are located on outside surface. Product inlet and outlet of feeder are tangential

end bells, one at each end, through which air enters feeder pockets near product-discharge point.

Chambers in bells are designed to maintain an air

Materials don't get manhandled on USS Cyclone Conveyor Belts

How much time is wasted in *your* plant because materials have to be manhandled—loaded and unloaded manually, or moved from place to place by old-fashioned, inefficient methods? USS Cyclone Conveyor Belts carry an astonishing variety of products through every kind of processing operation. They can pare hours—sometimes even *days*—off normal production time. They put an end to frustrating time lags, bottlenecks and down time. Naturally, this speedier production means higher profits.

Cyclone is the world's largest producer of metal conveyor belts. A Cyclone belt specialist can look over your operation and tell you which of our eight basic belt types will fill your requirements. Then a special conveyor system can be designed *exactly* to your specifications. Send the coupon today for a free booklet on USS Cyclone Conveyor Belts. No obligation.

USS and Cyclone are registered trademarks

Cyclone Sales Offices coast to coast.

American Steel & Wire Division of United States Steel

American Steel & Wire, Dept. 0484
614 Superior Ave., N.W., Cleveland 13, Ohio.

Please send me your free booklet on USS Cyclone Conveyor Belts.

Name_____

Address_____

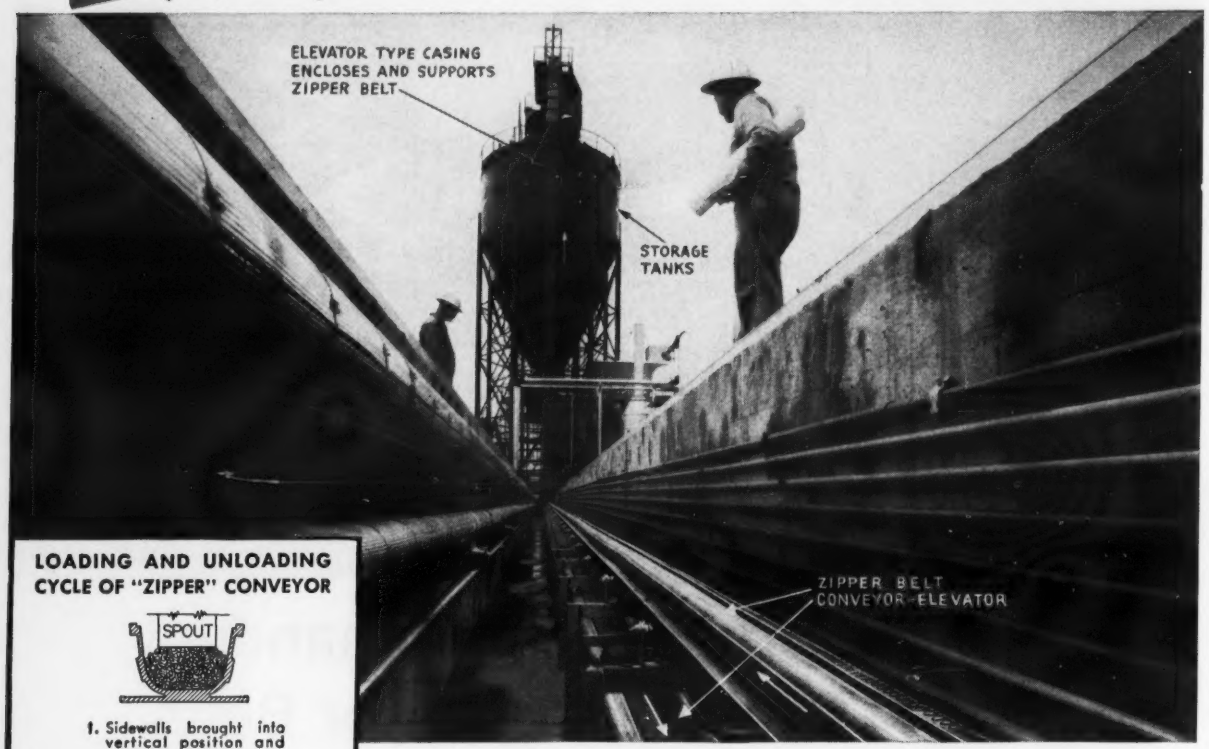
City_____ Zone____ State_____

7194 on Reader Service Slip.

STEPHENS-ADAMSON

EXCLUSIVE

"ZIPPER"* CLOSED-BELT CONVEYOR-ELEVATORS

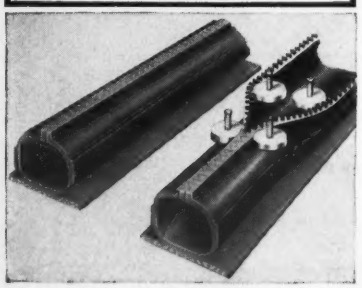


LOADING AND UNLOADING CYCLE OF "ZIPPER" CONVEYOR

1. Sidewalls brought into vertical position and ready for loading.

2. Flexible tube completely closed for conveying and elevating.

3. Rubber ZIPPER belt open for discharge, cleaning and return run.



Upper left unit closed and loaded. Lower right shows how belt is opened and closed by system of ball bearing rollers. (Rollers are mounted on a rigid framework)

CONVEYS AND ELEVATES BY CONTINUALLY WRAPPING MATERIAL IN A PACKAGE... MOVING THE PACKAGE AND ITS CONTENTS TO A NEW LOCATION AND GENTLY UNWRAPPING IT!

Literally a moving material-carrying conduit, the ZIPPER Conveyor is capable of transporting bulk materials in any plane, to considerable heights and around obstructions. Its great advantage is that bulk materials may be conveyed within the belt completely sealed and dust-tight. Material doesn't slide, isn't scooped, pushed or thrown but is gently carried over great distances without breakage, agitation or segregation. The ZIPPER Conveyor-Elevator provides versatility of layout and profitable material handling advantages you won't want to overlook.

*PATENTED

WRITE FOR BULLETIN 349

ENGINEERING DIVISION
STEPHENS-ADAMSON MFG. CO.
GENERAL OFFICE & MAIN PLANT, 17 RIDGEWAY AVENUE, AURORA, ILLINOIS

PLANTS LOCATED IN: LOS ANGELES, CALIFORNIA • CLARKSDALE, MISSISSIPPI
BELLEVILLE, ONTARIO

7195 on Reader Service Slip.

blanket between product and bearing. Thus product contact that might gum up bearing and rotor shaft is prevented.

In addition, double-inlet action thoroughly mixes air with product being conveyed. This action sweeps pockets clean and increases volumetric efficiency.

Supplier: The Day Company, 810 Third Avenue NE, Minneapolis 13, Minn.

7196 on Reader Service Slip.

Shows air-conveyor system variations

Air conveying systems for bulk handling of powdered or granular materials are described in four-page brochure, released by Flo-Tronics, Inc.

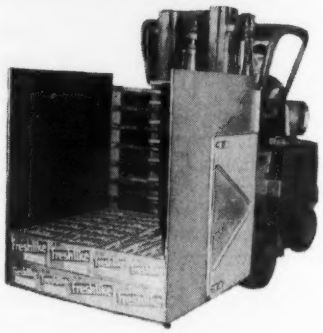
Numerous variations possible in engineering air conveying systems, including completely automated and programmed process cycles, are emphasized.

Literature is illustrated with diagrams showing typical equipment and systems arrangements. There are sketches of six delivery and unloading installations, five bulk-storage installations and four setups for sifting and batching.

7197 on Reader Service Slip.

"No, I didn't fix the leak, but I did make it more attractive, hey?"

Floor-to-ceiling utilization, with only four in. between tiers, makes utmost use of warehouse's 60,000-sq-ft space



"Skimming" of partial loads — during order picking — also can be accomplished with palletless carton clamp

Canner chooses palletless handling as

Most practical approach to canned foods warehousing

C. E. ROGERS
Director of Engineering
The Larsen Company

Problem: The Larsen Co., Green Bay, Wis., cans a variety of vegetables — processing as many as 25,000 cases daily during peak seasons.

Company stored its output in three company-owned warehouses in the Green Bay area — using conventional fork trucks to move and stack the palletized cartons of canned vegetables.

Officials realized that a central warehouse would have inherent distribution advantages, therefore consolidated their three area warehouses. In the course of centralizing warehouse operations, they also studied handling methods.

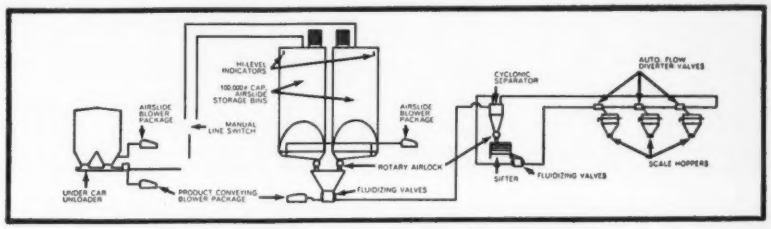
Larsen's management concluded that number of pallets needed to handle their volume would require an excessive

SUGAR. . . . STARCHES. . . . FOOD MIXES. . . . STARCHES. . . . INS
OFFEE. . . . STARCHES. . . . INSTANT COFFEE. . . . FOOD MIXES. . . . FLOU
FLOUR. . . . FOOD MIXES . . . INSTANT COFFEE . . . SUGAR INSTANT COFFEE.

bulk handling with FLO-TRONICS® *fluidization saves as much as 25¢ per hundredweight*

Since their introduction, more and more firms using powdered or granular materials are realizing the tremendous savings ($3.50 to $6.00 per ton) possible with Flo-tronics air conveying systems. These systems not only eliminate the cost of individual containers; they vastly reduce the high cost of hand labor, free precious space and working capital, and provide complete sanitation.

Flo-tronics Fluidization Systems are custom engineered. Costs vary according to a firm's capacity requirements and facilities. Typical savings realized by a baking firm handling bulk flour are illustrated in the following table. (See diagram for installation.)



The following is a cost study for a typical complete fluidizing system as shown above including plant layout, custom engineering, mechanical installation, automatic controls, and electrical installation $37,000.00
Down payment 7,000.00
$30,000.00
36 Month carrying charge . . . . . $ 4,500.00
Total Finance $34,500.00
Average monthly payment . . . . . $ 958.00
Product usage . . . . . 1500 CWT/per week
Bulk Savings . . . . . $0.25 per CWT
Total savings per month . . . . . $ 1,625.00
Total savings 36 months $58,500.00
Cost of system per month . . . . . $ 958.00
Cash Saving with system per month . . . . . $ 1,625.00
Net Saving per month . . . . . $ 667.00

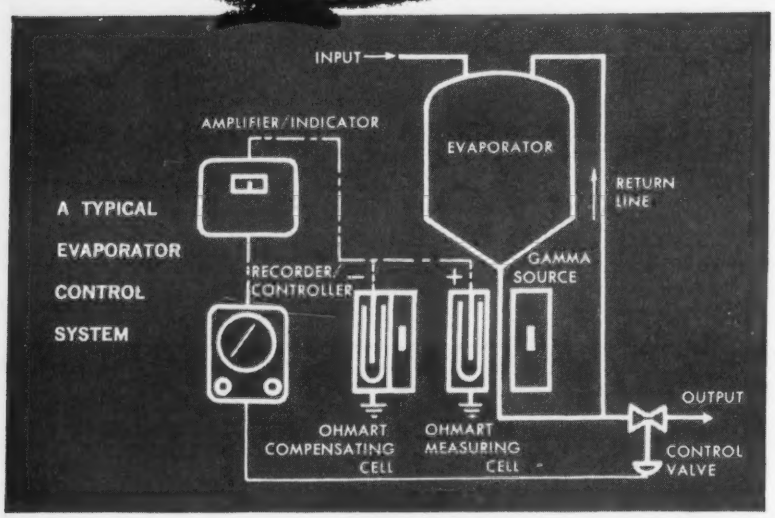
WILL A FLO-TRONICS FLUIDIZATION SYSTEM SAVE MONEY FOR YOU?

Whether or not such a system would be a profitable capital expenditure depends on such factors as capacity requirements, plant layout, and of course, reduction of costs. A general rule is that a system should pay for itself in 36 months or less. If you wish, Flo-tronics engineers will be glad to make an engineering evaluation of your material handling requirements. For an engineering estimate, write or call Mr. William P. Edmunds, **Dept. 212.**

FLO-TRONICS INC
1420 zarthan avenue
minneapolis 16, minn

7198 on Reader Service Slip.

$1200 EXTRA EARNINGS
PER DAY AFTER INSTALLING
OHMART
NUCLEAR DENSITY CONTROL



A food manufacturer, suspecting the inadequacy of his periodic solids sampling, installed an Ohmart Nuclear Density Control System to control tomato pulp density during evaporation.

Reports showed greatly increased output with the same input, and increased dollar earnings of $1200 per day. In just three days, these extra earnings paid off the cost of his Ohmart System.

TYPICAL FOOD PRODUCTS WHICH CAN PROFIT BY OHMART DENSITY CONTROL SYSTEMS

Applesauce	Cane Sugar	Instant Coffee	MSG	Soups
Baby Food	Catsup	Condensed Milk	Pumpkin	Powdered Tea
Beet Sugar	Pre-Cooked Cereal	Powdered Eggs	Salt	Tomato Paste

You, too, can cut costs and increase profits with Ohmart Nuclear Density Control, if in your process you use evaporators, spray dryers, drum dryers, or other equipment for making liquids, slurries or dry solids more or less dense. You can count on the System quickly paying for itself. You risk nothing by installing Ohmart, as satisfactory performance is guaranteed.

Get the full story on Ohmart and its profit potentials for you. Write or wire today.

ohmart The Ohmart Corporation 2234 Bogen St., Cincinnati 22, Ohio
World Leader in Process Control Thru Nuclear Energy
Engineering representatives in principal areas

7199 on Reader Service Slip.

capital outlay.

In fact, the impressive initial cost of pallets, coupled with estimated continuous pallet-maintenance costs, equalled purchase price of several pieces of mechanized equipment.

Solution: Company invested in equipment which handles cases without pallets, and also permits full use of vertical-storage "air rights" within the warehouse.

The three 5000-lb-capacity Clark C-50 fork trucks have high-lifting uprights and palletless carton clamps for accurate positioning of loads at maximum lift heights of 180 in.

Palletless carton clamp has two hydraulic cylinders which activate the lateral motion of two arms to maintain clamping pressure. Hard rubber facing on clamp pads provides a high-friction surface, permitting relatively low clamping pressures.

Clamping pressure is regulated by an adjustable pressure relief valve to prevent crushing products handled.

A side-shift mechanism which moves laterally a maximum of 11 in. on either side of center allows operator to position and set down loads of material without excessive truck maneuvering.

Clamps can be adjusted to handle loads in widths of 25 to 70 in. Clamp-lock safety device automatically locks pressure in hydraulic system until it is deliberately released through another switch — thus preventing operator from inadvertently dropping load.

Here's how Larsen handles cases of canned foods with the C-50 trucks.

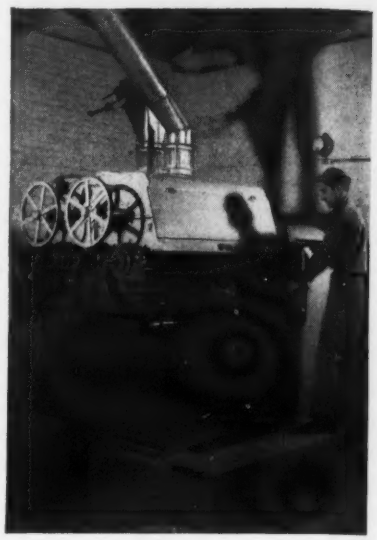
As cases leave case sealers on three packaging lines, they are stacked on floor at end of line in unit-load patterns.

Each 48 by 48 by 56 in. unit load, made up of 96 cases and weighing 3360 lb, is picked off floor with the hydraulically powered clamp attachment, and truck carries load either to storage or to boxcars.

In storage area, loads are stacked four-high in tiers 19½ ft high. Side-shift device on the clamp enables operator

Problem:

To speed up pepper grinding without losing volatile oils



Solution:

SPROUT-WALDRON
ROLLER MILLS

To grind pepper to −40 mesh at production rates from 2-3000 pounds per hour without generating excessive heat or causing unnecessary loss of volatile oils, Durkee Famous Foods, Bethlehem, Penna., installed a Sprout-Waldron pepper grinding system.

Heart of the system is the one-point control double roller mill. Design of this unit permits operator to set and align rolls with complete accuracy in a matter of seconds. The higher the production requirements, the more important is this one-point control feature.

For full details on the Durkee system, ask for Pointers, Vol. 2 No. 5. For specifications on the roller mill request Bulletin 153-A.

CW/109
SW SPROUT-WALDRON
Muncy, Pennsylvania
Size Reduction • Size Classification • Mixing
Bulk Materials Handling • Pelleting

7200 on Reader Service Slip.

to place loads so that only four-in. space occurs between tiers.

Loads to be shipped immediately are taken directly to boxcars by the lift trucks.

Company still uses four conventionally equipped fork trucks for moving palletloads of bright cans from boxcar or truck-trailer to storage, or directly to the automatic can depalletizer. These trucks also handle miscellaneous jobs on small lots.

Supplier: Clark Equipment Co., Industrial Truck Div., 1921 Escote St., Battle Creek, Mich. 7201 on Reader Service Slip.

Results: Storing loads 19½ ft high, and with only four in. between tiers, makes full use of all available space in the 60,000-sq-ft warehouse.

Using the C-50's enables Larsen Company to load four-fifths of each boxcar mechanically in about two hr — a time-saving of 50 per cent over former manual-loading methods. Remainder of each carload is hand stacked.

During winter months, loads must be shipped in heated refrigerator cars, hence have to be loaded-on manually since the small doors on these cars prevent use of mechanical loading equipment.)

Company has realized an extra advantage in having clamp-equipped trucks in their warehouse operations.

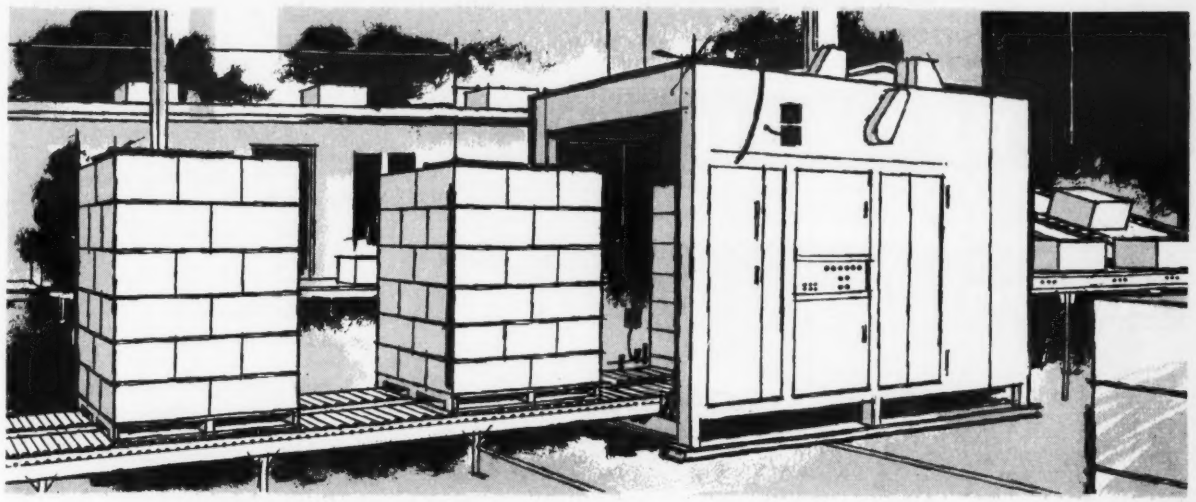
In addition to handling canned foods, the trucks are used to carry and stack banded loads of flattened corrugated boxes. This means of handling knocked-down boxes enables one man to keep all three case-sealing lines supplied — even during peak season operations. END

Magnesium Tote Bins at cost of aluminum

More over-the-road bulk shipping using lightweight magnesium Tote Bins is expected as result of new pricing policy which equalizes cost of standard sizes of magnesium models with cost of the aluminum type.

Because magnesium Tote

...AND THEN THEY INSTALLED AN ALVEY PALLET LOADER



—To Save Time, Work and Money

A wise move is to run your packaging line directly into an Alvey Pallet Loader. It's the real time-saving, work-saving, money-saving way to break your package-handling bottlenecks.

Individual cases are methodically received from one or several production lines, and automatically arranged in a predetermined pattern at a rate in excess of 45 cases per minute.

Easily adjust your Alvey Pallet Loader. In a few seconds you can change from one size carton to another, or switch from one stacking pattern to another.

For individual handling units, or a completely-integrated conveyor system, call in Alvey's experienced engineers. The cost-cutting possibilities are unlimited.

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Kraft Foods
Maxwell House
National Biscuit
Pet Milk
Welch Grape Juice

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tough

greasy, hot conditions slow down your production? Not with PUR-O-TEX conveyor belts!

Food processors find Ton-Tex Pur-O-Tex conveyor belting proves best for conveying foods under conditions that present some real problems. Pur-O-Tex is a white, non-toxic belting built specially to convey foods of all kinds. It is made of plies of selected duck welded with special compounds and treated to resist heat, oil, grease, water and mild abrasion. Pur-O-Tex belting won't impart taste or odor to the products carried. It is permanently pliable and can be vulcanized endless. Easy to wash and keep clean — an excellent "inspection" belt. Let our engineers help you select a trouble-free belt for your conveying jobs. *Write for folder today.*

TON-TEX CORPORATION, GRAND RAPIDS 2, MICH.
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NAVCO®

"LONG-STROKE" AIR VIBRATORS

Move Materials on BINS • HOPPERS • CHUTES

Navco "Long-Stroke" Air Vibrators dislodge arched material with a timed piston impact . . . do not "pack" materials with high frequency vibration. Exclusive patented "one-piece" design eliminates body assembly bolts, cuts vibrator maintenance up to 80%. Easy to install, units will operate in hazardous atmospheres, inclement weather or magnetic dusts.

Navco also manufactures a complete line of pneumatic feeders —trough and tubular, Dept. FP-12

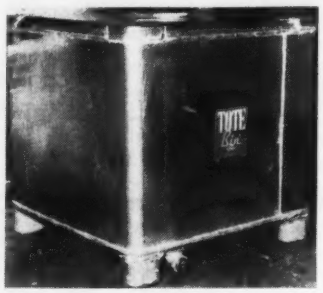
NATIONAL AIR VIBRATOR CO.
435 Literary Road • Cleveland 13, Ohio

Navco vibrators on exterior bins keep wet and frozen material moving at this Wisconsin plant. Solenoid valve gives automatic operation and control of bulk material.

7204 on Reader Service Slip.

Bins are about 40 per cent lighter than the aluminum, more payload can be delivered while still remaining within highway load limits.

The price equalization pol-



Bin serves as shipping container, storage unit and discharge hopper

icy applies to all sizes of Tote Bin — from the 42-cu-ft to 110-cu-ft capacity containers for dry bulk handling, to the 300- and 400-gal capacity Tote Tank for handling of liquids.

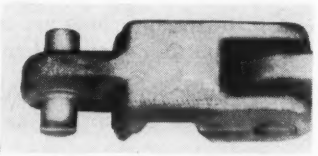
Supplier: Tote System, Inc., 680 S. 7th St., Beatrice, Nebr.

7205 on Reader Service Slip.

Conveyor elements forged in one piece

A new conveyor chain designed to last longer with minimum maintenance is available for service in dairies, breweries and other food plants.

Links in this conveyor feature a single piece forging without the usual removable connecting pin. Fabrication is

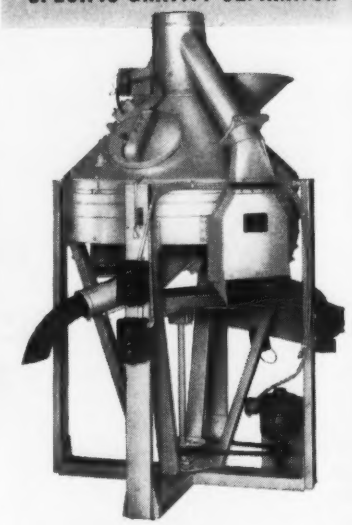


Sections may be inserted in many existing assemblies

with chrome alloy steel that is especially hardened after links are assembled into chain.

Completed chains are permanently assembled to desired or standard lengths at the factory. A special connecting link is used to connect the ends, or

Bauer
SPECIFIC GRAVITY SEPARATOR



upgrades
your food product

Through a unique combination of mechanical and pneumatic action, this Bauer "jitterbug" has established a new standard for cleaning and/or separating various materials by densities.

typical uses:

Cleaning peanuts, fancy nuts, grains, cereals, beans, dry onion skins, etc. Separating corn germ and grit, soybean hull and meat, cocoa nibs and shells, etc. Assures a cleaner end product with more sales appeal.

what it does:

Removes foreign material, chaff, twigs, shell fragments, string, small nuts in the shell, even dust and skins! Also stones, mud balls, glass, wire and other tramp metal thus protecting processing equipment from damage.

Send for complete information.

THE BAUER BROS. CO.
Springfield, Ohio

Bauer

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for field repairs.

The completed chain has a tensile strength of 47,000 pounds. Costs are competitive with conventionally constructed chains. A forged steel sprocket offering longer wear features is also available.

Supplier: Krop Speed Way, Inc., Union City, Tenn.

7207 on Reader Service Slip.

Issues new standard for steel conveyor pulleys

Welded Steel Conveyor Pulleys — Recommended Load Ratings for Standard Pulleys, is the first Standard issued on welded steel conveyor pulleys, and offers a basis for efficient and economical pulley selection.

Literature opens with several pages of data and formulas, including determination of actual resultant radial loads, for selection of correct pulleys.

Balance of standard contains a tabulation of load ratings for standard welded steel conveyor pulleys. There is also a list of pulley diameters and a list of pulley-face widths which are considered standard for the industry.

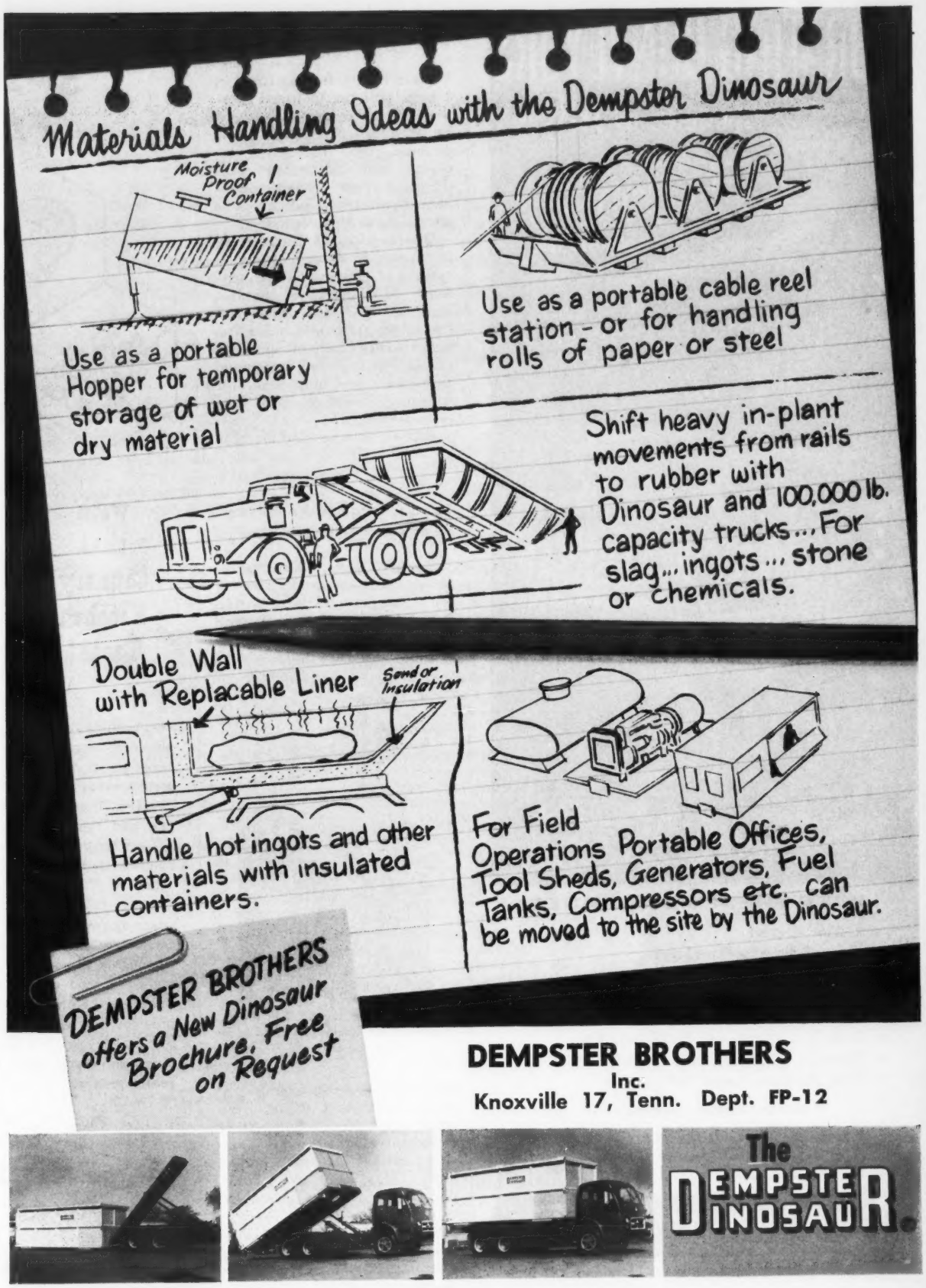
New standard of 16 pages is the work of the Steel Pulley Engineering Sub-committee of MVBD & MPTA, comprised of pulley and conveyor engineers and stress analysts.

Standard may be obtained for $1.00 from publisher, Multiple V-Belt Drive & Mechanical Power Transmission Association, 27 E. Monroe St., Chicago 3, Ill.

In-transit weighing of granular solids

Conveyor-scale systems for flow-rate control and total through-put measurement can be used with flat-bed or trough-type conveyors. Consisting of single scale with associated instrumentation or number of scales and instrumentation, they can be used with fixed- or variable-speed conveyors.

Systems for in-motion weight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THE CLEVELAND VIBRATOR CO.

12-G 2818 Clinton Ave. • Cleveland 13, Ohio

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measurements are described in 4-page bulletin, Unitized Conveyor-Scale Systems. Released by Weighing & Control Components, Inc., literature explains and illustrates with diagrams how system operates. Application and performance data are presented.

One section of Bulletin 60 is devoted to describing applications of conveyor-scale systems to variety of control functions in processing and formulating operations. Section also covers use of system's through-put data, expressed in weight per unit time, for inventory control and cost reduction.

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Solid storage racks for any need from ordinary pipe

Storage racks of unusual dimensions or configurations for various hard-to-store items, as well as ordinary-type racks for normal pallet storage requirements are quickly and economically constructed in processor's plant using ordinary pipe and Tube-Strut universal clamps.

Clamp (inset) is used with ordinary pipe usually on hand or easily obtained

If storage needs change, such racks can be quickly disassembled and reassembled to meet the new requirements.

Supplier: Tube-Strut universal clamps by Tube-Strut Corp., 2960 Marsh St., Los Angeles 39, Calif.

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. . . with that Country Kitchen Taste!

This is the day of jet-flight and dehydrated potatoes; atomic energy and frozen bread; super-sonic speed and "quicker-than-instant" mixes for everything from soups to desserts. This is the threshold of the space age and the era of convenience foods. Flavors for these modern foods must be as dynamic as the technology of their formulation . . . as carefully designed as the science that developed them. Yet, these space-age foods must still retain that home cooked taste. Only a company that keeps thoroughly abreast of the newest developments in food can give you this kind of "built for the product" flavor. Fries & Fries provides you with space-age flavors with that country kitchen taste! Let our laboratories show you what dynamic flavor research means.

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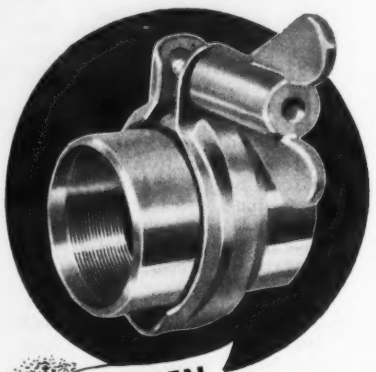
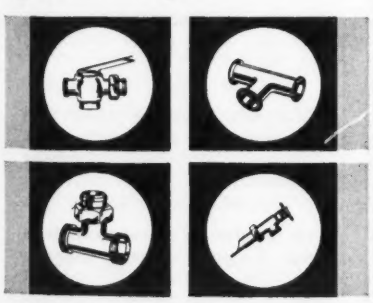


PROVEN CLAMP CONNECTIONS

Looking for a set-up on which to standardize? The answer is Thomsen stainless steel lines and fittings. Key to maximum efficiency for clamp-in-place or take-down lines is the new Thomsen vise action clamp which has more exclusive features than any clamp on the market. Go Thomsen all the way with pumps, tubing, fittings and valves. They will provide valuable engineering counsel on request.



THOMSEN MONO-MOUNT SANITARY PUMP

Here at last is the common sense sanitary pump design. The new Mono-Mount makes assembly and disassembly fast and easy. Stainless steel—no rust, no corrosion, easy cleaning.

FREE—New Thomsen clamp and fittings catalogs—write Department F

L.C. THOMSEN & SONS, INC. KENOSHA, WIS.

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technical literature Classified Listing

- Equipment
- Ingredients
- Supplies

Starred* items below have been more extensively reviewed elsewhere in the magazine. Key numbers in the last line will help to locate these reviews, which are numbered in sequence. Items followed by (†) indicate literature offered by advertisers—see Advertisers Index, p. 113

Processing Equipment, Accessories

High-capacity, liquid cyclone classifiers*, 8 pp. (Bul 2503) Dorr-Oliver Incorporated
7184 on Reader Service Slip.

Helps solve pumping, flow problems*, 20 pp. (Bul 77) Peerless Pump-Hydrodynamic Division, Food Machinery & Chemical Corporation
7170 on Reader Service Slip.

Mixers, sifters weighers and rollers for powdered, granular or crystalline products*, 24 pp. (Cat 806) B. F. Gump Company
7158 on Reader Service Slip.

Propeller-type mixers which provide a new level of competence in mixing fluids†, (Bul B-521) Mixing Equipment Co., Inc.
7214 on Reader Service Slip.

Line of heavy-duty compressors are designed for new efficiency and durability†, (Bul LA-1) Gardner-Denver Company
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Freezer equipment covers four separate methods; direct expansion, liquid recirculation, flooded and brine†, (Equipment Buls) The Vilter Manufacturing Company
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Solves even the most difficult separating problems†, (Bul 946) Pfaudler Permutit, Inc.
7217 on Reader Service Slip.

Steam injection hot water heaters in eight sizes from 500 to 50,000 gph†, (Free Bulletin) Pick Mfg. Co.
7218 on Reader Service Slip.

Drum dryers for wide variety of materials: cereals, syrup, vegetables, starch, yeast, baby foods, extracts, waste†, (Cat 384) Buflovak Equipment Div., Blaw-Knox
7219 on Reader Service Slip.

Liquid vibrating screens to separate solids from waste water†, (Book 2777) Link-Belt Company
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Complete line of corrosion resistant processing equipment†, (Bul) Lee Metal Products Company, Inc.
7221 on Reader Service Slip.

Seamless containers drawn to shape from single piece of metal offer greater sanitation, easier maintenance†, (Cat) Pressed Steel Tank Company
7222 on Reader Service Slip.

Ingredients, Food Additives

"Emulsifying, Thickening, Suspending and Stabilizing with Algin"*, 4 pp, (Bul F #40) Kelco Company
7103 on Reader Service Slip.

Torula yeast U.S.P. to improve and accentuate natural food flavors†, (Samples and Literature) Red Star Yeast & Products Company
7223 on Reader Service Slip.

Food-grade antioxidants for every purpose†, (Nine bulletins on Tenox-Eastman food-grade antioxidants; The Eastman family of Tenox food-grade antioxidants; Which antioxidants for your fat-containing foods?; Tenox antioxidants for more effective food packaging materials; Tenox antioxidants for edible animal fats; Effective stabilization of inedible animal fats with Tenox; Tenox feed-grade antioxidants for poultry and animal feeds; Tenox antioxidants for the fishing industry; and Mechanisms of fat oxidation) Eastman Chemical Products, Inc., Subsidiary of Eastman Kodak Company
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"Merck Research for the Food Industry"†, 24 pp, Merck Chemical Div., Merck & Co., Inc.
7225 on Reader Service Slip.

Chemical leavening agent saves baking time†, (Glucono-Delta-Lactone Technical Data; Suggested Glucono-Delta-Lactone Formulations; Free sample of Glucono-Delta-Lactone) Chas. Pfizer & Co., Inc. Chemical Sales Division
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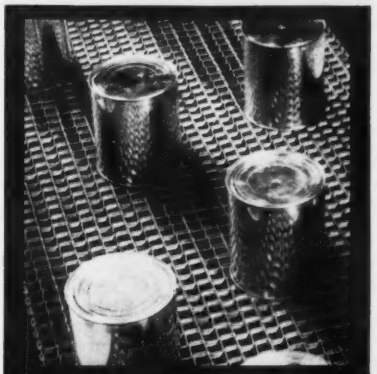
IF YOU PROCESS · PACK · SHIP FOOD



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WHEN you consider the lower initial cost, reduced maintenance, faster and easier sterilizing, longer service and improved performance of La Porte Belts, it's easy to add up the savings on every application. Besides, the rugged, flexible steel mesh construction takes heavy loads and impacts in stride, and permits the circulation of air and liquids around products in process. The open mesh feature also permits cleaning with a steam gun while in motion and assures a positive drive of the La Porte Sprocket.

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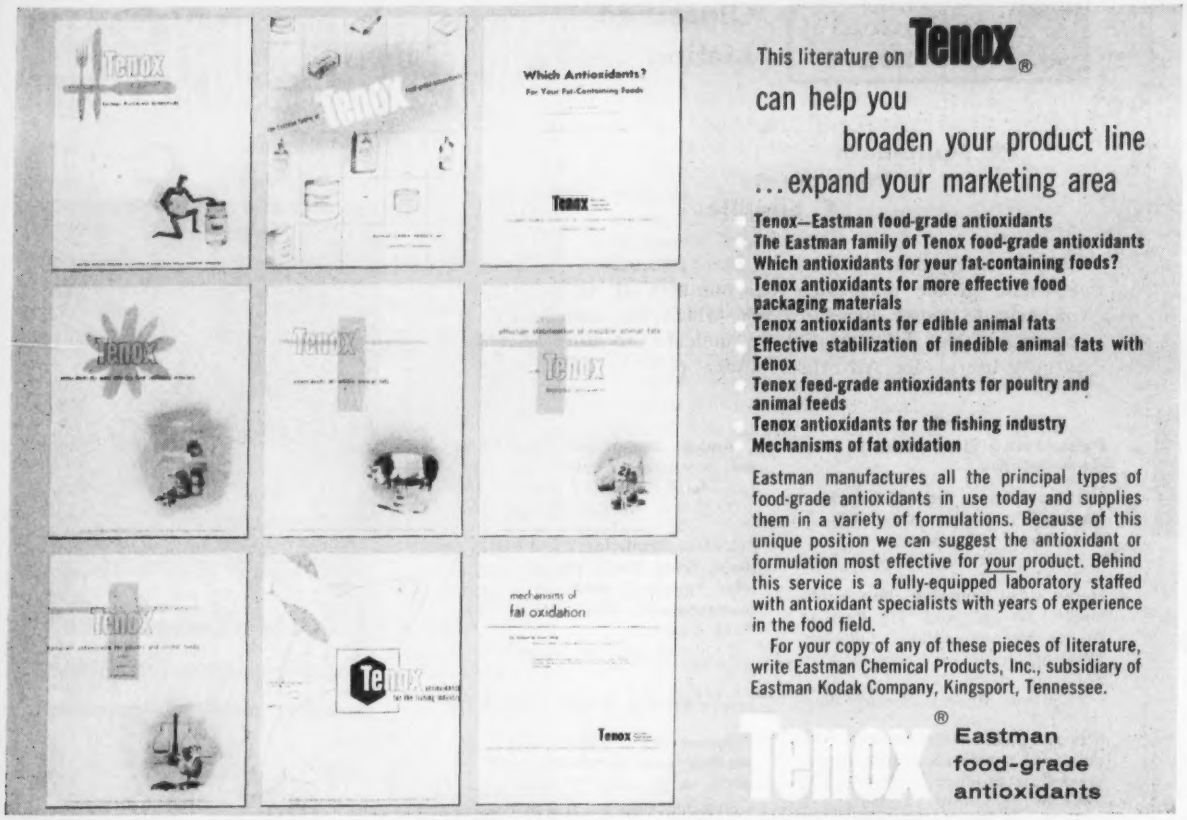

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- Tenox antioxidants for more effective food packaging materials
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Eastman manufactures all the principal types of food-grade antioxidants in use today and supplies them in a variety of formulations. Because of this unique position we can suggest the antioxidant or formulation most effective for your product. Behind this service is a fully-equipped laboratory staffed with antioxidant specialists with years of experience in the food field.

For your copy of any of these pieces of literature, write Eastman Chemical Products, Inc., subsidiary of Eastman Kodak Company, Kingsport, Tennessee.

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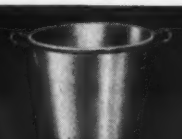

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For handling extra heavy tubs and containers. Available in three sizes, 21" diameter illustrated.

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HARLOW C. STAHL COMPANY, 1373 E. JEFFERSON AVE., DETROIT 7, MICH.

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new literature

Anti-foamers or defoamers for every job†, (Foam Control Manual) Dow Corning Corporation
7230 on Reader Service Slip.

Distilled acetylated monoglycerides approved for food use†, (Bul A-1) Distillation Products Industries
7231 on Reader Service Slip.

Spray-dried sweet whey for use in bakery foods, frozen foods, dry mixes, sauces, processed foods, confections or ice cream†, (Sample and Data) Kraft Foods Company Industrial Division
7232 on Reader Service Slip.

Hydrolyzed plant proteins for beef, veal, pork, fowl and sea food products†, (Free samples and data) The Nestle Company, Inc.
7233 on Reader Service Slip.

Packaging, Labeling, Cartoning

Specific advantages of auger filling, and how to select equipment*, 8 pp, (Bul P-811) FMC
7114 on Reader Service Slip.

Ultra-high speed, 10-station can-closing machine*, 4 pp, Continental Can Co.
7124 on Reader Service Slip.

Practical guide to the canning of carbonated beverages*, 28 pp, Continental Can Company
7118 on Reader Service Slip.

Detailed guide to setting up soft drink canning lines*, 50 pp, Continental Can Co.
7123 on Reader Service Slip.

Bulk Handling, Accessories

Describes different air-conveyor systems*, 4 pp, (Broch) Flo-Tronics, Inc.
7197 on Reader Service Slip.

"Materials Handling Ideas with the Dempster Dinosaur"†, (New Dinosaur Brochure) Dempster Brothers, Inc.
7234 on Reader Service Slip.

Air vibrators to move materials on bins, hoppers, chutes†, (Application Cat) National Air Vibrator Co.
7235 on Reader Service Slip.

Conveyors, Racks, Accessories

In-motion weighing of granular solids on belt conveyors*, 4 pp, (Bul 60) Weighing & Control Components, Inc.
7210 on Reader Service Slip.

Conveys material within a belt, completely sealed and dust-tight†, (Bul 349) Stephens-Adamson
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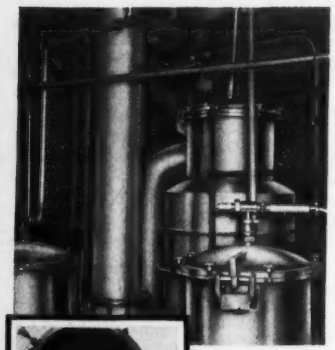

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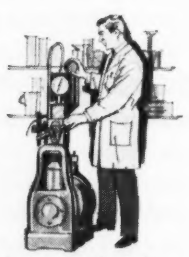
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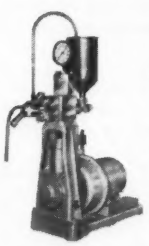

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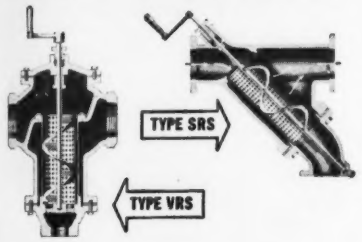

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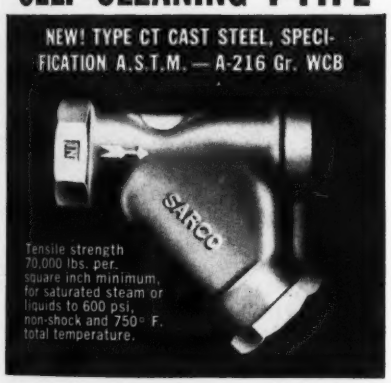
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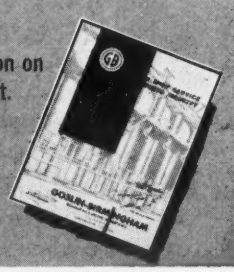

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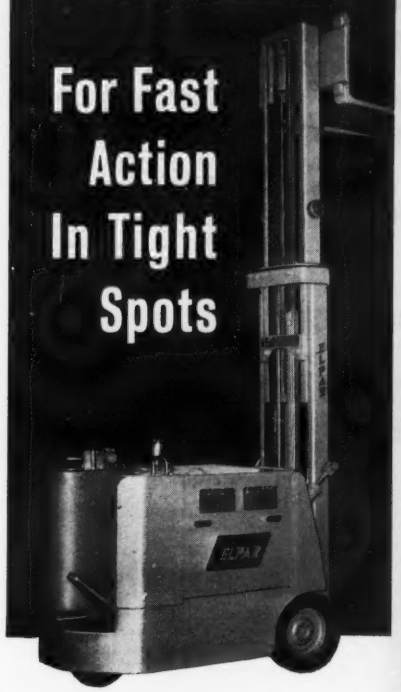

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